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ABSTRACT

This document, one of five volumes comprising a training program in instructional materials development designed for educational research and development personnel, provides practice in all the major tasks involved in the program. These final exercises provide an opportunity to put together component activities and practice them in combination just as in a real situation. Two types of materials are provided: (a) materials to work on directly and (b) materials representing completed prior analyses. This volume is divided into nine final tasks: (a) making revisions in an instructional program; (b) developing an instructional program; (c) formulating an instructional strategy; (d) developing tests; (e) planning simulation; (f) stating objectives, (g) analyzing criterion behavior, and (h) developing an instructional program through the complete cycle. (PD)

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A Technology For Developing Instructional Materials

5 FINAL EXERCISES

A. PLAN STUDY OF CRITERION BEHAVIORS

B. COLLECT AND ANALYZE DATA ABOUT CRITERION BEHAVIORS

C. SEQUENCE AND GROUP CRITERION BEHAVIORS

D. STATE CRITERION AND PREPARATORY OBJECTIVES

E. PLAN SIMULATION BASED ON INSTRUCTIONAL AND LOGISTICAL NEE

F. DEVELOP DIAGNOSTIC AND EVALUATIVE TESTS

G. FORMULATE INSTRUCTIONAL STRATEGIES

H. PLAN ACCOMMODATION OF INDIVIDUAL DIFFERENCES

I. DEVELOP INSTRUCTIONAL MATERIALS

J. EVALUATE INSTRUCTIONAL MATERIALS

AUTHOR:

George L. Gropper

Published by:

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A Technology For Developing Instructional Materials

5 FINAL EXERCISES

Volume Titles:

1. USER'S MANUAL
2. ORIENTATION
3. HANDBOOK
4. WORKBOOK
▶ 5. FINAL EXERCISES

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AUTHOR:

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VOLUMES IN THIS SERIES

1. USER'S MANUAL
2. ORIENTATION
3. HANDBOOK
   (eleven sub-volumes)
4. WORKBOOK
5. FINAL EXERCISES

FOREWORD

This FINAL EXERCISES volume is but one of five major volumes which comprise a training program in instructional materials development designed for educational R&D personnel. It was prepared to provide personnel taking the program practice in all the major tasks involved in the instructional materials development process.

The USER'S MANUAL describes the role each of the five major volumes is designed to play. It also prescribes the sequence in which each of the separate volumes is to be used. Personnel taking this program are, therefore, urged to read the instructions contained in the USER'S MANUAL before attempting to use this or any of the other separate volumes.

ACKNOWLEDGMENTS

The materials in this volume were prepared under a contract from the U.S. Office of Education, Contract No. OEC-0-70-4776(520). Dr. George L. Gropper, Director of Instructional Media Studies, served as principal investigator.

U.S.O.E. sponsorship does not in any way imply official endorsement of the views expressed in this volume.

The author is indebted to Miss Kathleen Gubala for her tireless preparation of the complex manuscript required by this FINAL EXERCISES volume.

George L. Gropper
March 1973

GENERAL INSTRUCTIONS

Each of the ten major TASKS in the materials development process (TASKS A-J) involves several STEPS and Sub-STEPS. WORKBOOK exercises gave you the opportunity to practice executing separate Sub-STEPS and, in some instances, just portions of a Sub-STEP. In the FINAL EXERCISES which appear in this volume you have the opportunity to put together these component activities and to practice them in combination, just as you would in a real, job-like situation.

Each FINAL EXERCISE provides you with two types of materials: (1) the materials you are to work on directly; and (2) the materials representing completed prior analyses. For example, when you are required to formulate an instructional strategy (TASK G), you will be given the results of all the necessary prior analysis on which you are to base your formulations (i.e. task analyses, statements of objectives, tests, etc.). Much of this prior analysis is summarized and condensed on specially prepared forms.

The training you are receiving is sequenced in a backward order, i.e. you are starting with TASK J rather than with TASK A. Therefore, when you are given the results of prior TASKS in the development process, you will not have learned how to perform prior tasks and cannot be expected to make *full* use of all the information provided.

In earlier exercises brief orienting instructions are provided to call your attention to specific information available on the completed FORMS. You will need merely to familiarize yourself with the information on the FORMS to which the orienting instructions call attention. The rest of the information on the FORMS, particularly when shorthand symbols are used, may be ignored until such time as you have had practice in using it.

The FORMS are presented in their entirety often before you are able to use all the information on them. They are intended to serve as models which, when you are subsequently given practice relevant to each prior task using the forms, you will be better prepared to follow yourself.

SCHEDULE

AFTER COMPLETING ALL WORKBOOK EXERCISES IN SECTION:	DO FINAL EXERCISE #:	TASK TITLE:
J	1	MAKING REVISIONS IN AN INSTRUCTIONAL PROGRAM
I	2	DEVELOPING AN INSTRUCTIONAL PROGRAM
G	3	FORMULATING AN INSTRUCTIONAL STRATEGY
F	4	DEVELOPING TESTS
E	5	PLANNING SIMULATION
D	6	STATING OBJECTIVES
B	7 & 8	ANALYZING CRITERION BEHAVIOR

=

After completing *FINAL EXERCISES 1-8*	9	THE COMPLETE CYCLE IN DEVELOPING AN INSTRUCTIONAL PROGRAM TASKS B-J

FINAL EXERCISE #1

MAKING REVISIONS IN AN INSTRUCTIONAL PROGRAM

NOT TO BE PERFORMED UNTIL ALL WORKBOOK EXERCISES ASSOCIATED WITH HANDBOOK SECTION "J" HAVE BEEN COMPLETED.

FINAL EXERCISE #1:
Making Revisions in an Instructional Program

Before doing this exercise, you should have completed the following tasks:

(1) Read HANDBOOK Section "J": EVALUATE INSTRUCTIONAL MATERIALS:

and

(2) Do the WORKBOOK exercises associated with Section "J."

Your assignment in this exercise is to perform TASK J: "making revisions in an instructional program".

As a basis for performing this task, starting on page 1.3 you will be given completed results for prior TASKS in the materials development process which you are to review briefly.

Following your review of these results, you are to revise the instructional program which appears in the section beginning on page 1.13.

The development of the program which you are expected to revise was based on the results of prior TASKS in the development process. This section contains those results.

Before proceeding to the "revisions" assignment on page 1.13, briefly review the completed FORMS which contain the results of the various PRIOR DEVELOPMENT TASKS.

RESULTS OF PRIOR DEVELOPMENT TASKS
WHICH ARE MADE AVAILABLE TO YOU

TASK LABEL	TASK TITLE	FORM NO.
B	Task analysis, learning analysis, competency analysis, and mode analysis	A.5(4)
D	Statement of objectives	D.2(1) and D.2(2)
E	Simulation plans	E.1(1)
F	Test development	F.2(1)
G	Instructional strategies	G.1(2)

Review the results of these prior TASKS beginning on the next page.

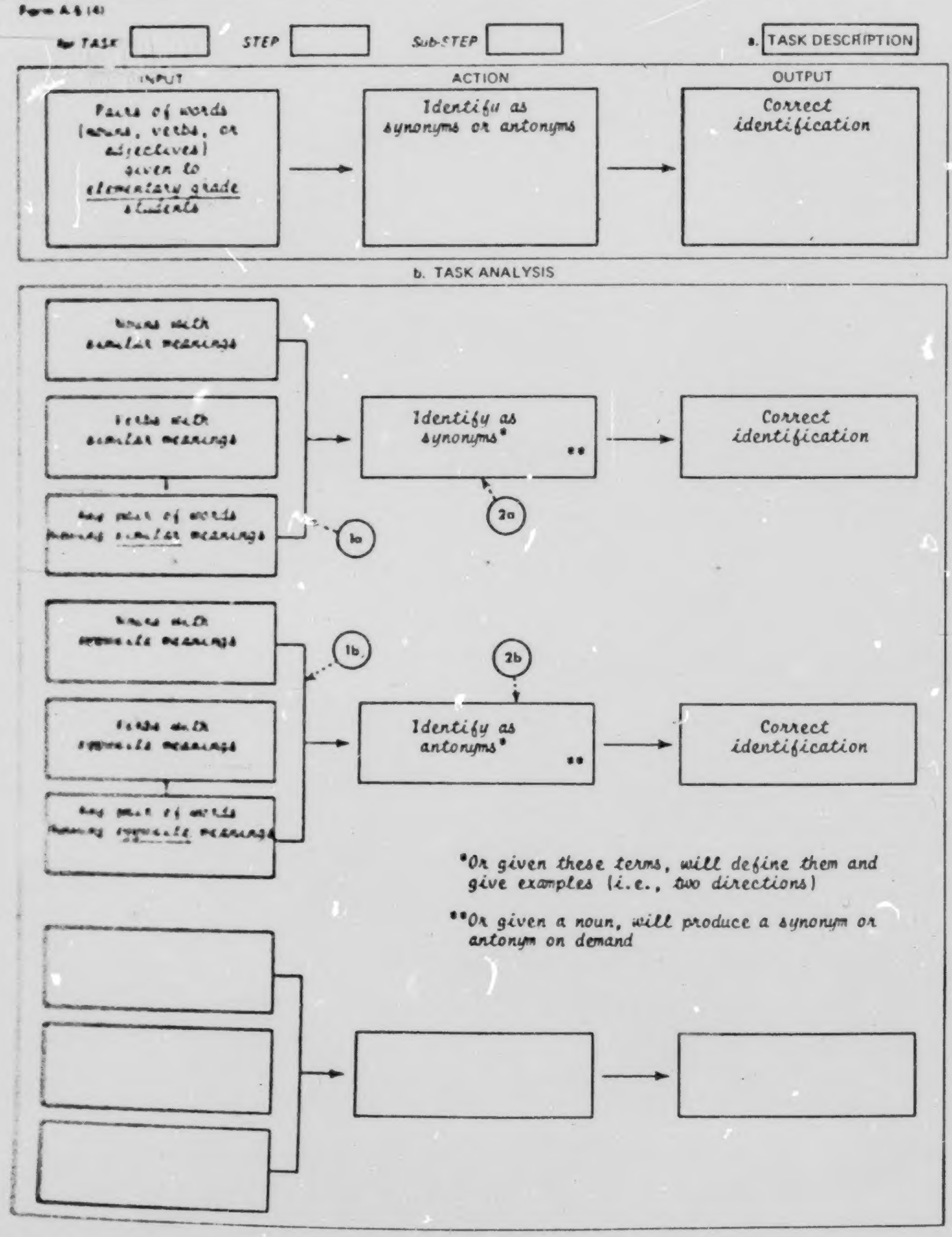
THESE RESULTS REFLECT ANALYSES OF WHAT IS INVOLVED IN TEACHING (PRIMARY GRADE) STUDENTS TO BE ABLE TO IDENTIFY, DEFINE, AND ILLUSTRATE: "SYNONYMS" AND "ANTONYMS."

NOTE: Section "b" of FORM A.5(4) identifies:

1 --the classes of word types (1a) and (1b) which have to be discriminated one from the other.

--the variety of word types within class (1a) and within class (1b) which have to be generalized (seen as being similar).

2 the ACTION (response) (2a) or (2b) to be associated with each class of word type.



Form A.5(4)
TASK
STEP
Sub-STEP
a. TASK DESCRIPTION
INPUT
ACTION
OUTPUT
Pairs of words (nouns, verbs, or adjectives) given to elementary grade students
Identify as synonyms or antonyms
Correct identification
b. TASK ANALYSIS
Nouns with similar meanings
Verbs with similar meanings
Any pair of words showing similar meanings
1a
Identify as synonyms* **
2a
Correct identification
Nouns with opposite meanings
Verbs with opposite meanings
Any pair of words showing opposite meanings
1b
2b
Identify as antonyms* **
Correct identification

*Or given these terms, will define them and give examples (i.e., two directions)

**Or given a noun, will produce a synonym or antonym on demand

NOTE: ① The endorsement of the TRANSFER boxes in the column marked "competency analysis" signifies that on a test the learner will be required to respond to new examples (those not encountered during instruction).

② There is an endorsement of "hi" anticipated generalization difficulty in section "c" of the FORM — due to the large number of new words in the language the learner may be faced with.

COMPETENCY ANALYSIS ▽

c. LEARNING ANALYSIS

level of difficulty in acquiring

d. MODE ANALYSIS

INPUT

①

recall ☐

transfer ☒

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			X
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity			X
No. of properties			X
② *No. of inputs*	X		

		symbolic	verbal	environmental
VISUAL	realistic		X	
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

ACTION/ CHAIN

recall ☐

transfer ☒

ASSOCIATIONS

due to ▽	hi	med	lo
No. of associations			X
associative strength of other actions			

GENERALIZATIONS

	hi	med	lo
integrative strength of action		X	

CHAINS

	hi	med	lo
length of chain			
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub/vocal
recognition				
editing				
production		X		X

OUTPUT

recall ☐

transfer ☐

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity			
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic		X	
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

NOTE: --There are three criterion objectives (one on each row) for the program which has already been prepared and which you will revise.

--Each statement identifies (in each column):

- ••what will be presented to the student (GIVEN)
- ••what he will do (STUDENT WILL)
- ••the output and its standards (RESULTING IN)

Form D.2(1)

LESSON ☐

SPECIFICATION OF OBJECTIVES

	GIVEN	STUDENT WILL	RESULTING IN
	Criterion Inputs ● mode: visual/verbal/etc. ● number of examples from class ● new and/or old examples ● typical/atypical conditions ● availability of performance aids	Criterion Actions ● mode: recognition, editing, production ● alternatives: new and/or old examples ● mode: perceptual/motor/vocal/sub-vocal	Criterion Outputs ● mode: visual/verbal/etc. ● limits, standards ● quantitative: amount /degree/time limits ● qualitative
1.	CRITERION -Pairs of words (nouns, verbs, or adjectives) -Both new and old examples of synonyms or antonyms	Identify them as synonyms or antonyms	Correct identification 100%
2.	CRITERION -Terms "synonym" and "antonym"	Will define the terms in his own words and give two (new) examples of each	Correct definition and examples 100%
3.	CRITERION -Single words (high frequency words) -Request for either a synonym or antonym	Produce a synonym or an antonym	Correct synonym or antonym 100%

NOTE: --The objectives on the opposite page are used by the developer. The "objectives" on this page are given to the student when he goes through the program which is developed.

--The first two columns (GIVEN and YOU WILL) reproduce the information used by the developer.

--The third column identifies for the student what he has to learn in order to be able to perform what is identified in the first two columns.

Form D.2(2)

LESSON ☐

STATEMENT OF OBJECTIVES FOR STUDENTS

	GIVEN	YOU WILL	YOU MUST LEARN TO
	Inputs ● objects, people, events, words, symbols, etc. ● their properties ● examples: number, new or old ● availability of performance aids ● typical/atypical conditions ● problem format e.g., single input vs. multiple choice	Actions ● select, edit, or produce ● type of action e.g., point to, label, write, classify, etc. RESULTING IN Outputs ● objects, events, words, symbols, etc. ● their properties (quantity/quality) ● standards of acceptability	● distinguish between examples from ___ # ___ input classes ● on the basis of ___ # ___ properties ● see similarity among examples within each of the ___ # ___ input classes ● on the basis of ___ # ___ properties ● associate one of ___ # ___ actions with each one of the ___ # ___ input classes ● exhibit ___ # ___ alternative actions ● exhibit the series of associations in the ___ chain
1.	-Given pairs of nouns which are either synonyms or antonyms and with the aid of a special dictionary to look up words you may not know	You will identify the pairs as being synonyms or antonyms	-You must learn to tell the difference between two types of relationships between words -These relationships are based on similarity or dissimilarity of meaning
2.	-Given the terms "synonym" and "antonym"	You will be expected to define them in your own words and to provide two (correct) examples of each (your own)	-You will also have to remember which type of relationship is called a synonym and which is called an antonym
3.	-Given a noun	-You will be expected to produce either a synonym for it or an antonym -You will be expected to get all test items correct	

NOTE: --The decision whether or not to have students practice with a simulated version of the criterion behavior is based on two sets of criteria, one instructional and the other logistical.

-- ① The "N" entries in the top portion of the FORM signify that on all criteria there is a NEGLIGIBLE need for simulation.

--Accordingly, there are no simulation plans entered in the bottom section of the FORM.

Form E.1(1)

LESSON ☐ OBJECTIVE ☐

SIMULATION DECISIONS

a. assessing simulation needs due to

①

LOGISTICAL CONSIDERATIONS			INSTRUCTIONAL CONSIDERATIONS		
downtime	cost	danger	sampling	standardization	manipulation
N	N	N	N	N	N

b. planning simulation when needed

No simulation needed - all paper and pencil

INPUT types	PROPERTIES: physical, psychological	SIMULATION PLANS: visual, audio, etc.
people		
man made objects		
natural objects		
events		
words		
symbols		
other		

ACTION types		
perceptual		
motor		
vocal		
sub-vocal		

OUTPUT types		
people		
man made objects		
natural objects		
events		
words		
symbols		
other		

NOTE: --The TEST to be given to students is outlined on this FORM.

--Three types of test items 1a , 1b , & 1c are identified and a total of twenty items listed in row No. 1.

--The remaining two rows indicate what the student is expected to do.

Form F 2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT		
	1a	1b	1c
— Instructions — Question or Problem ••INPUTS (new/old) ••AIDS (when applicable)	For each pair, check whether it is a synonym, an antonym, or neither: (1) modern/ancient (2) radio/television (3) repaired/fixed (4) difference/likeness (5) written/spoken (6) less/fewer than	In your own words define the terms: (7) "synonym" and (8) "antonym" Give two examples of each (of your own): (9), (10) synonyms and (11), (12) antonyms	Give me a synonym and an antonym for the following words: (13) quick (14) often (15) departed (16) begin (17) riches (18) warmth (19) build (20) handsome
••ANSWER OPTIONS (when applicable)			

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO		
— ACTIONS (new/old) ••mode	2a. Checks "synonym," "antonym," or "neither" for each pair	2b. Produces a definition and two examples for each term	2c. Produces a synonym and an antonym

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT		
— OUTPUT ••answers ••product — Type of Scoring — Standards for Scoring	3a. 100% correct	3b. Idea of "similar meaning" and "opposite meaning" present in definition; two examples for each term	3c. Similar and opposite meanings acceptable without attention to fine shadings in meaning

NOTE: --Pages 1.10 and 1.11 contain the FORM used in planning an instructional strategy for the performance described and analyzed on the preceding pages.

--Row IA on this page: The circled endorsements summarize the analyses entered on pages 1.4 and 1.5.

--Row IIA: The endorsements in row IA serve as a basis for entering the matrix on row IIA and thereby identifying potential strategies.

--Row III: This now provides a reminder of other procedures which need to be performed.

Form G 1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE	LEARNING PROBLEMS	PROBLEM SOURCE	MODE
☐ simulation ☐ aids available [✓ ☐] two directions [✓ 1] transfer 2 delayed basis ☐ recognition mode	INPUTS [✓ 3] discriminations [✓ 4] generalizations INPUTS & ACTIONS 5 associations 6 chains ACTIONS 7 generalizations ☐ partial proficiency	INPUTS [✓ A] similarity (dis-) B No. of properties C No. of classes (or, No. members/class) INPUTS & ACTIONS D existing associations E length of chain ACTIONS F integrative strength	INPUTS / OUTPUTS [✓ i] verbal/symbolic [✓ i] ii environmental ii iii audio iii iv non-realistic iv v transient v ACTIONS vi perceptual / viii vocal [✓ vii] motor / ix sub-vocal

IIA. Select Preparatory Practice Progression(s)

UNIT SIZE	MODE	PROMPTING/FADING	CONTENT	FREQUENCY or VARIATION
a. shaping gradual increases in: .. quantity .. quality	b. R/E/P c. visual/verbal d. concrete/abstract e. procedures/principles	f. examples or demonstrations g. verbal cues h. visual cues i. diagramming, overviews	j. principles/procedures k. altered criterion/criterion l. errors/criterion m. editing/criterion n. backward chaining	o. repetition p. review q. varied examples

		2	A	B	C	D	E	F	*i*	*vi*	*vii*
1	q	o-p	g	g				g-i	e	h	i
3	b-q	i-o-p	g-h-k	i-g	i					h	
4	b-q	i-o-p	g-h	i-g	i-g				g	h	i
3+4	[✓ b-i-q]	i-o-p	[✓ g-h]	i-g	i-g				[✓ c-d-e-i]		
5	b-o	i-o-p			i-g-o-p	b-g-l					
6	a-f-m-n	o-p					a-n				a-m-n
7	i	o-p						g-h-j			i

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION	PROVIDE FEEDBACK	REINFORCE PRACTICE	PROVIDE DELAYED REINFORCEMENT
Advance Organizers .. statement of objectives .. instructions *Cues* .. visual or verbal .. formats, diagrams .. checklists	*Correctness of Answers (Solutions)* .. standard available for comparison .. discrimination practice re: correct outputs	*Intrinsic Reinforcers* .. interesting materials *Extrinsic Reinforcers* .. social .. monetary .. activities .. grades	*Extrinsic Reinforcers* .. social .. monetary .. activities

NOTE: --Row IB describes the three types of criterion behavior it is planned to have students practice at the tail end of the instructional program.

--Row IIB describes the types of prior practice it is planned to use in preparing students to be able to engage in practice of the criterion behavior.

--Row IV describes the selection of media required to permit the above types of practice.

PLAN INSTRUCTIONAL STRATEGIES

IB. Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
EXAMPLE(S) properties of additional examples	(1) Terms "synonym" and "antonym"	Define them and give two examples	Illustrated definition
	(2) Single nouns, verbs, or adjectives and told to give a synonym or antonym	Will produce them	Correct synonym or antonym
	(3) Pairs of words	Will indicate whether they are synonyms, antonyms, or neither	Correct identification

IIB. Design Preparatory Practice Progression

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT
Recognition 1st	Pairs of words; verbal cues to assist; easy, examples, e.g., big/large	Indicate whether they mean the same thing, or something different, or something opposite	Correct identification of relationship among meanings of word pairs
Recognition 2nd	Pairs identified as having the same or opposite meanings	Identify as synonyms or antonyms	Correct identification
Editing and production 3rd	Single words	Produce a synonym or antonym	Correct synonym or antonym

IIC. Characterize

INPUTS	MODE	OUTPUTS
[✓ i]	verbal/symbolic	[✓ i]
ii	environmental	ii
iii	audio	iii
iv	non-realistic	iv
v	transient	v
	ACTIONS	
vi	perceptual	
[✓ vii]	motor writing	
viii	vocal	
ix	subvocal	

IV. Select Media

INPUT/OUTPUT DISPLAY

r.	print	s.	environmental	t.	devices
r.1	verbal	s.1	people (behavior)	t.1	film, TV
r.2	pictorial	s.2	objects	t.2	slides, projectors
		s.3	events	t.3	simulator
				t.4	audio-tape

	i verbal/symbolic		ii environmental		
INPUTS ► ▼	iii audio	visual	iii audio	visual v transient	visual non-v.
realistic	s.1		s.2 s.3	s.3	s.1 s.2
iv non-realistic	t.4	[✓ r.1] r.2 t.1 t.2 t.3	t.4	t.1 t.3	t.2 t.3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u.	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS ►	i verbal/symbolic		ii environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non-v.
vi & ix	t.4	u		u		
vii		[✓ u]	t.4	u	t.1	s.2 t.3
viii	t.4					

INSTRUCTIONS

The program you are to revise appears on page 1.14 in this section.

Your revision should be based on the data summarizing errors made by students on the program (on page 1.15) and on data summarizing errors made on the test given to students after they completed taking the program (on page 1.17).

CONTENTS IN THIS SECTION

FORM NO.	TITLE	PAGE
FORM I.2(1)	Developing instructional materials	1.14
FORM J.2(1)	Summary of errors on program	1.15
	The CRITERION TEST	1.16
FORM J.2(2)	Errors on the CRITERION TEST	1.17

YOUR ASSIGNMENT

(1) Review the error data provided in this section and then revise the program which appears on page 1.14. Your revisions may consist of:

--changing existing problems

--adding or subtracting problems

--combining problems

(2) Try out your revised program with at least one student (preferably five students).

(3) YOUR PRODUCT WILL BE A REVISED PROGRAM.

NOTE: --This program was developed on the basis of the analyses which have appeared on the preceding pages.

--Based on the new data appearing on page 1.15, you will revise this program.

--Note that there are nine (I-IX) frames calling for a total of twenty-three separate responses.

Form 1.2(1)

DEVELOPING INSTRUCTIONAL MATERIALS

LESSON ☐ (SUB-) CRITERION BEHAVIOR ☐

	MAXIMUM ASSISTANCE	INTERMEDIATE ASSISTANCE	NO ASSISTANCE
RECOGNIZE	I Next to each pair of words, indicate with an X whether the words have similar meanings, opposite meanings, or neither: S O N 1. small/big ___ 2. big/large ___ 3. small/pretty ___	II Words having similar meanings are called "snyonyms." Words having opposite meanings are called "antonyms." Next to each of the following pairs of words, write in either "synonym," "antonym," or "neither." 4. small/big ___ 5. big/large ___ 6. small/large ___	III Match up these definitions: A. Words with similar meanings B. Words with opposite meanings 7. ___ synonyms 8. ___ antonyms
EDIT	IV Someone incorrectly called this pair of adjectives antonyms: quick/fast What should they have called them? 9. ___	V This is an incorrect definition for the word "synonyms." Change the definition. 10. "Synonyms are words having opposite meanings."	VI Is this a correct definition for the word "antonums"? If not, change it and make it correct. 11. "Antonyms are words having the same meanings."
PRODUCE	VII Indicate whether each of these pairs is a synonym, antonym, or neither. S A N 12. tall/short ___ 13. truth/lie ___ 14. boat/house ___ 15. auto/car ___ 16. gold/silver ___	VIII Write a synonym and an antonym for each of the following words: 17. happiness 18. practical 19. intelligent 20. return 21. tired Also write another word for each which is neither a synonym nor an antonym.	IX Define the terms "synonym" and "antonym" and give two of your own examples for each. 22. ___ 23. ___

NOTE: --This page summarizes the errors made by students on each of the twenty-three problems in the program on page 1.14 (opposite).

--The hash marks appear in the row which indicates what the nature of the error is; e.g., for item #3, six students incorrectly called "small/pretty" synonymous.

-- *Each response in the program is treated as a practice item. Therefore, there are results for 23 items (rather than just 9). Twenty people took the program.*

Form J 2(1)

LESSON ☐ (SUB-) CRITERION BEHAVIOR ☐

SUMMARY OF ERRORS ON ~~CRITERION TEST~~ PROGRAM

ITEM #'S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Options Endorsed		I			II			III	IV	V	VI			VII					VIII				IX		
a. *synonym			𝍸 /			𝍸 /	///							/			////		///			𝍸			
b. *antonym					𝍸 /			//						//			////			𝍸			𝍸 ///		
c. *neither				𝍸 /													////		//						
									𝍸					/											
e. *where applicable										𝍸 ///															
Total Number of People Making Errors																									
% of Group Making Errors N = 20																									
Performance Requirements	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
INPUT recall																									
INPUT transfer																									
ACTION recall																									
ACTION transfer																									

This is the Criterion TEST taken from the test development FORM F.2(1) (which appears on page 1.7)

For each pair of words, indicate with a check whether it is a synonym (S), antonym (A), or neither (N).

	S	A	N
1. modern/ancient	___	___	___
2. radio/television	___	___	___
3. repaired/fixed	___	___	___
4. difference/libreners	___	___	___
5. written/spoken	___	___	___
6. less/fewer than	___	___	___

In your own words, define the following terms:

7. synonym: ______________________________

____

8. antonym: ______________________________

____

Create your own examples of two synonyms:

9. ______________ / ______________

10. ______________ / ______________

Create your own examples of two antonyms:

11. ______________ / ______________

12. ______________ / ______________

In the spaces preceded, write in a synonym and an antonym for the following words:

	synonym	antonym
13. quick	___________	___________
14. often	___________	___________
15. departed	___________	___________
16. begin	___________	___________
17. niches	___________	___________
18. warmth	___________	___________
19. build	___________	___________
20. handsome	___________	___________

NOTE: --Errors on the test (opposite) are summarized in this FORM.

--Complete the FORM by tabulating across rows and down columns.

--Use these data (along with program errors on page 1.15) as a basis for revising the program.

Form J.2(2)

LESSON ☐ (SUB-) CRITERION BEHAVIOR ☐

TEST ERRORS*

	ITEM NUMBERS																											RECALL	TRANSFER	TOTAL	%
STUDENTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	No. of Items	No. of Items	No. of Items	Total Errors / Total No. of Items
a.				/			/	/	/	/	/	/				/	/		/												
b.															/					/											
c.			/															/													
d.																															
e.									/					/	/																
f.	/	/		/	/		/	/					/	/	/		/	/	/	/											
g.																															
h.																/	/	/													
i.							/	/																							
j.				/																											
k.							/	/		/							/														
l.																				/											
m.								/	/																						
n.			/		/	/		/		/					/	/	/	/													
o.							/	/																							
p.																															
q.							/			/																					
l.								/		/																					
m.										/						/		/		/											
n.							/	/																							
Percentage of Students																														n =	

N = 20 students

*all test items are TRANSFER items

In making your revisions of the program on page 1.14 either use blank paper or a blank FORM 1.2(1).*

*Blank forms are available either in the HANDBOOK sub-volume "I" or "X."

DO NOT TURN PAGE
UNTIL YOU HAVE COMPLETED
YOUR REVISION OF THE PROGRAM

After you have completed your revision of the program, refer to the suggested revision which appears on page 1.21 for comparison purposes. Your revision is, of course, not very likely to look like the one printed here. However, if you can provide a rationale for your own revision, and, more important, if you try out your revised program and it works, matching the suggested revision exactly becomes irrelevant.

Try out your revised program with at least one student.

ANSWER:

SUGGESTED REVISIONS

Before Cell #I: Add these two items

1a. *Think about the meaning of these two words:*

large - small

These two words:

__ *Mean the same thing*

__ *Have opposite meanings*

1b. *The words "boy" and "dog" don't mean the same thing. They also don't have opposite meanings.*

How about these two words:

cheerful - poor

Do they:

__ *Mean the same thing*

__ *Have opposite meanings*

__ *Neither*

Following Cell #VI: Add these two items

6a. *Here is an example of antonyms:*

good - bad

Make up your own example of an antonym.

____

Now, in your own words, define "antonyms."

____

6b. *Here is an example of synonyms:*

sad - unhappy

Make up your own example of a synonym.

____

Now, in your own words, define "synonyms."

____

Following Cell #VII: Add this item

7a. *Your task is to make up a word to fill the blanks:*

	Synonym	Antonym	Neither
cheerful -		unhappy	building
brave -	courageous		distant
fear -	fright	courage	

FINAL EXERCISE #2

DEVELOPING AN INSTRUCTIONAL PROGRAM

*NOT TO BE PERFORMED UNTIL
ALL WORKBOOK EXERCISES
ASSOCIATED WITH HANDBOOK
SECTION "I" HAVE BEEN
COMPLETED.*

FINAL EXERCISE #2:
Developing an Instructional Program

Before doing this exercise, you should have completed the following tasks:

(1) Read HANDBOOK Section "I": DEVELOP INSTRUCTIONAL MATERIALS

and

(2) Do the WORKBOOK exercises associated with Section "I."

Your assignment in this exercise is to perform TASK I; "developing an instructional program." As a basis for performing this task, starting on the next page you will be given completed results for prior tasks in the materials development process.

Following your review of these results, you are to develop your own program using materials provided in the section beginning on page 2.13.

Before doing the "materials development" assignment, review the completed FORMS which contain the results of PRIOR DEVELOPMENT TASKS.

RESULTS OF PRIOR DEVELOPMENT TASKS
WHICH ARE MADE AVAILABLE TO YOU

TASK LABEL	TASK TITLE	FORM NO.
B	Task analysis, learning analysis, competency analysis, and mode analysis	A.5(4)
D	Statement of objectives	D.2(1) and D.2(2)
E	Simulation plans	E.1(1)
F	Test development	F.2(1)
G	Instructional strategies	G.1(2)

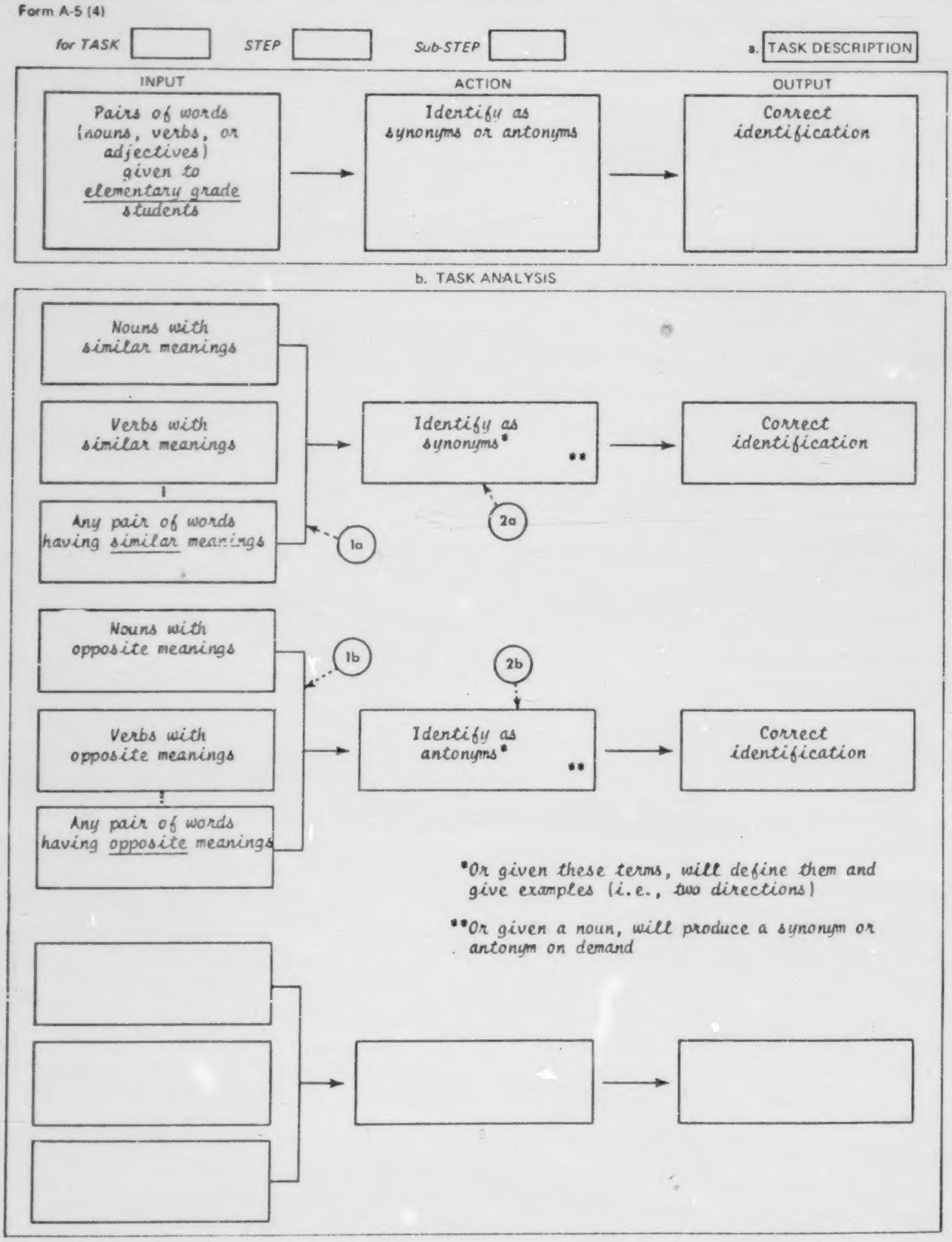
Review the results of these prior TASKS which begin on the next page. They are the same ones as used in FINAL EXERCISE #1.

NOTE: Section "b" of FORM A.5(4) identifies:

1 --the classes of word types (1a) and (1b) which have to be discriminated one from the other.

--the variety of word types within class 1a and within class 1b which have to be generalized (seen as being similar).

2 the ACTION (response) (2a) or (2b) to be associated with each class of word type.



Form A-5 (4)

for TASK ☐ STEP ☐ Sub-STEP ☐ a. TASK DESCRIPTION

INPUT
Pairs of words (nouns, verbs, or adjectives) given to elementary grade students
ACTION
Identify as synonyms or antonyms
OUTPUT
Correct identification
b. TASK ANALYSIS
Nouns with similar meanings
Verbs with similar meanings
Any pair of words having similar meanings
1a
Identify as synonyms* **
2a
Correct identification
Nouns with opposite meanings
Verbs with opposite meanings
Any pair of words having opposite meanings
1b
2b
Identify as antonyms* **
Correct identification

*Or given these terms, will define them and give examples (i.e., two directions)

**Or given a noun, will produce a synonym or antonym on demand

NOTE: ① The endorsement of the TRANSFER boxes in the column marked "competency analysis" signifies that on a test the learner will be required to respond to new examples (those not encountered during instructions).

② There is an endorsement of "hi" anticipated generalization difficulty in section "c" of the FORM — due to the large number of new words in the language the learner may be faced with.

COMPETENCY ANALYSIS ▽

c. LEARNING ANALYSIS

level of difficulty in acquiring

d. MODE ANALYSIS

INPUT

①

recall ☐

transfer ☒

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			X
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity			X
No. of properties			X
② — *No. of inputs*	X		

		symbolic	verbal	environmental
VISUAL	realistic		X	
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

ACTION/ CHAIN

recall ☐

transfer ☒

ASSOCIATIONS

due to ▽	hi	med	lo
No. of associations			X
associative strength of other actions			

GENERALIZATIONS

	hi	med	lo
integrative strength of action		X	

CHAINS

	hi	med	lo
length of chain			
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub/vocal
recognition				
editing				
production			X	

OUTPUT

recall ☐

transfer ☐

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity			
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic		X	
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

NOTE: --There are three criterion objectives (one on each row) for the program which has already been prepared and which you will revise.

--Each statement identifies (in each column):

- ••what will be presented to the student (GIVEN)
- ••what he will do (STUDENT WILL)
- ••the output and its standards (RESULTING IN)

Form D 2(1)

LESSON ☐

SPECIFICATION OF OBJECTIVES

	GIVEN	STUDENT WILL	RESULTING IN
	Criterion Inputs ● mode: visual/verbal/etc. ● number of examples from class ● new and/or old examples ● typical/atypical conditions ● availability of performance aids	Criterion Actions ● mode: recognition, editing, production ● alternatives: new and/or old examples ● mode: perceptual/motor/vocal/sub-vocal	Criterion Outputs ● mode: visual/verbal/etc. ● limits, standards ● quantitative: amount /degree/time limits ● qualitative
1.	CRITERION -Pairs of words (nouns, verbs, or adjectives) -Both new and old examples of synonyms or antonyms	Identify them as synonyms or antonyms	Correct identification 100%
2.	CRITERION -Terms "synonym" and "antonym"	Will define the terms in his own words and give two (new) examples of each	Correct definition and examples 100%
3.	CRITERION -Single words (high frequency words) -Request for either a synonym or antonym	Produce a synonym or an antonym	Correct synonym or antonym 100%

NOTE: --The objectives on the opposite page are used by the developer. The "objectives" on this page are given to the student when he goes through the program which is developed.

--The first two columns (GIVEN and YOU WILL) reproduce the information used by the developer.

--The third column identifies for the student what he has to learn in order to be able to perform what is identified in the first two columns.

Form D.2(2)

LESSON ☐

STATEMENT OF OBJECTIVES
FOR STUDENTS

	GIVEN	YOU WILL	YOU MUST LEARN TO
	Inputs • objects, people, events, words, symbols, etc. • their properties • examples: number new or old • availability of performance aids • typical/atypical conditions • problem format e.g., single input vs. multiple choice	Actions • select, edit, or produce • type of action e.g., point to, label, write, classify, etc. RESULTING IN Outputs • objects, events, words, symbols, etc. • their properties (quantity/quality) • standards of acceptability	• distinguish between examples from ___ # ___ input classes • on the basis of ___ # ___ properties • see similarity among examples within each of the ___ # ___ input classes • on the basis of ___ # ___ properties • associate one of ___ # ___ actions with each one of the ___ # ___ input classes • exhibit ___ # ___ alternative actions • exhibit the series of associations in the ___ chain
1.	-Given pairs of nouns which are either synonyms or antonyms and with the aid of a special dictionary to look up words you may not know	You will identify the pairs as being synonyms or antonyms	-You must learn to tell the difference between two types of relationships between words -These relationships are based on similarity or dissimilarity of meaning
2.	-Given the terms "synonym" and "antonym"	You will be expected to define them in your own words and to provide two (correct) examples of each (your own)	-You will also have to remember which type of relationship is called a synonym and which is called an antonym
3.	-Given a noun	-You will be expected to produce either a synonym for it or an antonym -You will be expected to get all test items correct	

NOTE: --The decision whether or not to have students practice with a simulated version of the criterion behavior is based on two sets of criteria, one instructional and the other logistical.

-- ① The "N" entries in the top portion of the FORM signify that on all criteria there is a NEGLIGIBLE need for simulation.

--Accordingly, there are no simulation plans entered in the bottom section of the FORM.

Form E.1(1)

LESSON ☐ OBJECTIVE ☐ SIMULATION DECISIONS

a. assessing simulation needs due to

①

LOGISTICAL CONSIDERATIONS			INSTRUCTIONAL CONSIDERATIONS		
downtime	cost	danger	sampling	standardization	manipulation
N	N	N	N	N	N

b. planning simulation when needed

No simulation needed - all paper and pencil

INPUT types	PROPERTIES: physical, psychological	SIMULATION PLANS: visual, audio, etc.
people		
man made objects		
natural objects		
events		
words		
symbols		
other		

ACTION types		
perceptual		
motor		
vocal		
sub-vocal		

OUTPUT types		
people		
man made objects		
natural objects		
events		
words		
symbols		
other		

NOTE: --The TEST to be given to students is outlined on this FORM.

--Three types of test items 1a , 1b , & 1c are identified and a total of twenty items listed in row No. 1.

--The remaining two rows indicate what the student is expected to do.

Form F 2(1)

LESSON ☐ OBJECTIVE ☐ FORM FOR TEST DEVELOPMENT

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT		
	1a	1b	1c
— Instructions — Question or Problem ••INPUTS (new/old) ••AIDS (when applicable) ••ANSWER OPTIONS (when applicable)	For each pair, check whether it is a synonym, an antonym, or neither: (1) modern/ancient (2) radio/television (3) repaired/fixed (4) difference/likeness (5) written/spoken (6) less/fewer than	In your own words define the terms: (7) "synonym" and (8) "antonym" Give two examples of each (of your own): (9), (10) synonyms and (11), (12) antonyms	Give me a synonym and an antonym for the following words: (13) quick (14) often (15) departed (16) begin (17) riches (18) warmth (19) build (20) handsome

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO		
— ACTIONS (new/old) ••mode	2a. Checks "synonym," "antonym," or "neither" for each pair	2b. Produces a definition and two examples for each term	2c. Produces a synonym and an antonym

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT		
— OUTPUT ••answers ••product — Type of Scoring — Standards for Scoring	3a. 100% correct	3b. Idea of "similar meaning" and "opposite meaning" present in definition; two examples for each term	3c. Similar and opposite meanings acceptable without attention to fine shadings in meaning

NOTE: --Pages 1.10 and 1.11 contain the FORM used in planning an instructional strategy for the performance described and analyzed on the preceding pages.

--Row IA on this page: The circled endorsements summarize the analyses entered on pages 1.4 and 1.5.

--Row IIA: The endorsements in row IA serve as a basis for entering the matrix on row IIA and thereby identifying potential strategies.

--Row III: This now provides a reminder of other procedures which need to be performed.

Form G 1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE	LEARNING PROBLEMS	PROBLEM SOURCE	MODE
☐ simulation ☐ aids available [✓ ☐] two directions [✓ 1] transfer 2 delayed basis ☐ recognition mode	INPUTS [✓ 3] discriminations [✓ 4] generalizations INPUTS & ACTIONS 5 associations 6 chains ACTIONS 7 generalizations ☐ partial proficiency	INPUTS [✓ A] similarity (dis.) B No. of properties C No. of classes (or, No. members/class) INPUTS & ACTIONS D existing associations E length of chain ACTIONS F integrative strength	INPUTS OUTPUTS [✓ i] verbal/symbolic [✓ i] ii environmental ii iii audio iii iv non-realistic iv v transient v ACTIONS vi perceptual viii vocal [✓ vii] motor ix sub-vocal

IIA. Select Preparatory Practice Progression(s)

UNIT SIZE	MODE	PROMPTING/FADING	CONTENT	FREQUENCY or VARIATION
a shaping gradual increases in: quantity quality	b R/E/P c visual/verbal d concrete/abstract e procedures/principles	f examples or demonstrations g verbal cues h visual cues i diagramming, overviews	j principles/procedures k altered criterion/criterion l errors/criterion m editing/criterion n backward chaining	o repetition p review q varied examples

		2	A	B	C	D	E	F	*i*	*vi*	*vii*
1	q	o·p	g	g				g i	e	h	l
3	b·q	i·o·p	g·h·k	i·g	i					h	
4	b·q	i·o·p	g·h	i·g	i·g				g	h	l
3+4	[✓ b·i·q]	i·o·p	[✓ g·h]	i·g	i·g				[✓ c·d·e·i]		
5	b·o	i·o·p			i·g·o·p	b·g·l					
6	a·f·m·n	o·p					a·n				a·m·n
7	l	o·p						g·h·i			l

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION	PROVIDE FEEDBACK	REINFORCE PRACTICE	PROVIDE DELAYED REINFORCEMENT
Advance Organizers . statement of objectives . instructions *Cues* . visual or verbal . formats, diagrams . checklists	*Correctness of Answers (Solutions)* standard available for comparison discrimination practice re: correct outputs	*Intrinsic Reinforcers* . interesting materials *Extrinsic Reinforcers* . social monetary activities . grades	*Extrinsic Reinforcers* . social . monetary . activities

NOTE: --Row IB describes the three types of criterion behavior it is planned to have students practice at the tail end of the instructional program.

--Row IIB describes the types of prior practice it is planned to use in preparing students to be able to engage in practice of the criterion behavior.

--Row IV describes the selection of media required to permit the above types of practice.

IB. Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
	(1) Terms "synonym" and "antonym"	Define them and give two examples	Illustrated definition
EXAMPLE(S)	(2) Single nouns, verbs, or adjectives and told to give a synonym or antonym	Will produce them	Correct synonym or antonym
properties of additional examples	(3) Pairs of words	Will indicate whether they are synonyms, antonyms, or neither	Correct identification

IIB. Design Preparatory Practice Progression

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT
Recognition 1st	Pairs of words; verbal cues to assist; easy examples, e.g., big/large	Indicate whether they mean the same thing, or something different, or something opposite	Correct identification of relationship among meanings of word pairs
Recognition 2nd	Pairs identified as having the same or opposite meanings	Identify as synonyms or antonyms	Correct identification
Editing and production 3rd	Single words	Produce a synonym or antonym	Correct synonym or antonym

IIC. Characterize

MODE

INPUTS		OUTPUTS
[✓ i]	verbal/symbolic	[✓ i]
☐ ii	environmental	☐ ii
☐ iii	audio	☐ iii
☐ iv	non-realistic	☐ iv
☐ v	transient	☐ v

ACTIONS

☐ vi perceptual
[✓ vii] motor writing
☐ viii vocal
☐ ix subvocal

IV. Select Media

INPUT/OUTPUT DISPLAY

r.	print	s	environmental	t	devices
r.1	verbal	s.1	people (behavior)	t.1	film, TV
r.2	pictorial	s.2	objects	t.2	slides, projectors
		s.3	events	t.3	simulator
				t.4	audio tape

	i verbal/symbolic		ii environmental		
INPUTS ► ▼	iii audio	visual	iii audio	visual v transient	visual non v
realistic	s.1		s.2 s.3	s.3	s.1 s.2
iv non-realistic	t.4	[✓ r.1] r.2 t.1 t.2 t.3	t.4	t.1 t.3	t.2 t.3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u.	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS ►	i verbal/symbolic		ii environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non-v.
vi & ix	t.4	u		u		
vii		[✓ u]	t.4	u	t.1	s.2 t.3
viii	t.4					

YOUR ASSIGNMENT

Based on the materials you have just reviewed, develop your own program:

(1) Use the FORM which appears on page 2.15 in your program. Create practice problems to go with the diagram. The diagram should be designed to provide the necessary cuing to your students.

(2) When completed, administer the program and the criterion test to at least one student (preferably five students).

(3) Sit with the student as he goes through the program. When he makes errors, probe for their sources.

(4) Revise the program in the light of tryout results.

YOUR PRODUCTS WILL INCLUDE:

--an instructional program

--protocols of student responses to probes

--program and test results

--a revised program

CONTENTS IN THIS SECTION

FORM NO.	TITLE	PAGE
	Diagram for use in program	2.15

CONCEPTS	SYNONYM		ANTONYM		NEITHER
Examples		VS		VS	
Definition					
DEFINING ROPERTIES					
OSSIBLE ARIATIONS					
USE IN A SENTENCE					

DO NOT TURN PAGE
UNTIL YOU HAVE DEVELOPED
YOUR OWN PROGRAM

AFTER you have completed developing your own program, and AFTER you have tried it out with at least one student, refer to the next several pages for a sample program using a diagram.

CONCEPTS	SYNONYM		ANTONYM		NEITHER
Examples	handsome - good looking distant - far defend - protect big - large	VS	hardsome/ugly distant/close defend/attack big/small	VS	handsome -- late distant -- crowded defend -- leave big -- cheap
Definition					
DEFINING PROPERTIES	-A word that has the same meaning as another word -Two words that have the same or similar meaning are called "synonyms" (plural)		-A word that has the opposite meaning to another word -Two words that have opposite meanings are called "antonyms" (plural)		-A word that is neither a synonym nor an antonym for another word
POSSIBLE VARIATIONS	-Various parts of speech can have synonyms for each other: ••Two nouns: honesty - truthfulness ••Two verbs: to enter - to go in ••Two adjectives: near - close ••Two adverbs: rapidly - quickly		-Various parts of speech can have antonyms for each other: ••Two nouns: honesty/dishonesty ••Two verbs: to enter/to leave ••Two adjectives: distant/close ••Two adverbs: rapidly/slowly		••Two nouns: honesty -- timeliness ••Two verbs: to enter -- to pay ••Two adjectives: distant -- rich ••Two adverbs: rapidly -- closely
USE IN A SENTENCE	-"Bad" is a synonym for "evil" -"Bad" and "evil" are synonyms -"Bad" and "evil" are synonymous		-"Bad" is an antonym for "good" -"Bad" and "good" are antonyms		

1. Read the diagram and then classify the following pairs of words.

	Synonyms	Antonyms	Neither
a. tall short			
b. truth lie			
c. boat house			
d. auto car			
e. gold silver			
f. small big			
g. replace return			
h. storm house			
i. cooperative uncooperative			
j. jealous envious			

CONTINUED

DO NOT REFER TO THE DIAGRAM ANY LONGER

2. Here is an example of antonyms:

   good - bad

   Make up your own example of an antonym.

   ____

   Now, in your own words, define "antonyms."

   ____

3. Here is an example of synonyms:

   sad - unhappy

   Make up your own example of a synonym.

   ____

   Now, in your own words, define "synonyms."

   ____

4. This is an incorrect definition for the word "synonyms." Change the definition.

   "Synonyms are words having opposite meanings."

   ____

5. Is this a correct definition for the word "antonyms"? If not, change it and make it correct.

   "Antonyms are words having the same meanings."

   ____

6. Write a synonym and an antonym for each of the following words:

   -happiness

   -practical

   -intelligent

   -return

   -tired

   Also write another word for each which is neither a synonym nor an antonym.

7. Define the terms "synonym" and "antonym" and give two of your own examples for each.

FINAL EXERCISE #3

FORMULATING AN INSTRUCTIONAL STRATEGY

NOT TO BE PERFORMED UNTIL ALL WORKBOOK EXERCISES ASSOCIATED WITH HANDBOOK SECTION "G" HAVE BEEN COMPLETED.

FINAL EXERCISE #3:
Formulating an Instructional Strategy

Before doing this exercise, you should have completed the following tasks:

(1) Read HANDBOOK Section "G": FORMULATE INSTRUCTIONAL STRATEGIES

and

(2) Do the WORKBOOK exercises associated with Section "G."

Your assignment in this exercise is to perform TASK G: "formulating instructional strategies." As a basis for performing this task, starting on the next page you will be given completed results for prior tasks in the materials development process.

Following your review of these results, you are to formulate an instructional strategy using the FORMS which appear in the section beginning on page 3.13.

Before doing the instructional strategy assignment, review the completed FORMS which contain the results of PRIOR DEVELOPMENT TASKS.

RESULTS OF PRIOR DEVELOPMENT TASKS WHICH ARE MADE AVAILABLE TO YOU

TASK LABEL	TASK TITLE	FORM NO.
B	Task analysis, learning analysis, competency analysis, and mode analysis	A.5(4)
D	Statement of objectives	D.2(1) and D.2(2)
E	Simulation plans	E.1(1)
F	Test development	F.2(1)

Review the results of these prior TASKS beginning on the next page.

These results reflect analyses of what is involved in teaching (secondary grade) students: (1) to identify the sign of the slope of line segments, and (2) to compute the slopes of those line segments.

NOTE: The task analysis results identifies three classes of INPUT situations which have to be discriminated:

(1a), (1b), + (1c)

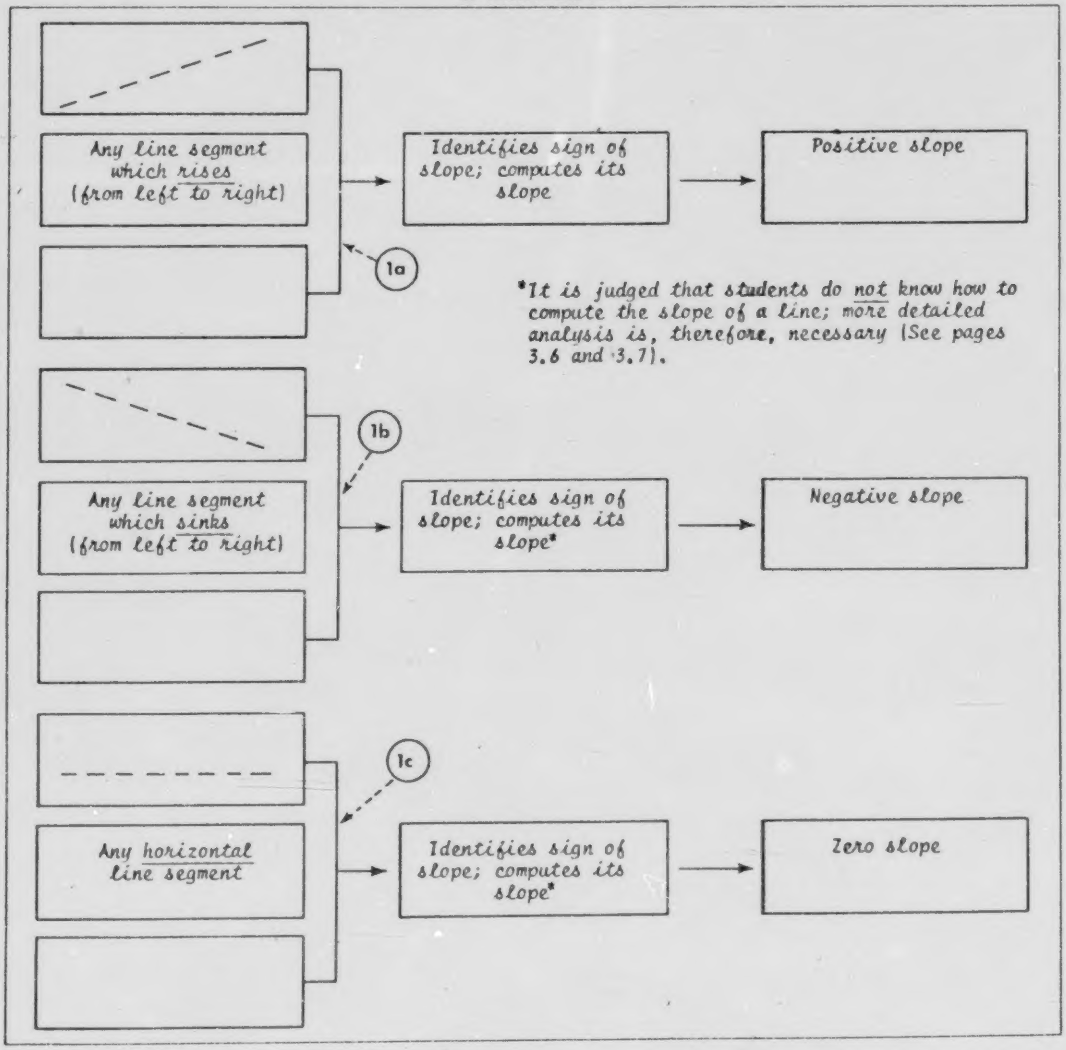
--Read the note in the middle of the FORM.

Form A-5 (4)

for TASK ☐ STEP ☐ Sub-STEP ☐ a. TASK DESCRIPTION

INPUT → ACTION → OUTPUT

b. TASK ANALYSIS


Any line segment which rises (from left to right)
Identifies sign of slope; computes its slope
Positive slope
1a
Any line segment which sinks (from left to right)
1b
Identifies sign of slope; computes its slope*
Negative slope
1c
Any horizontal line segment
Identifies sign of slope; computes its slope*
Zero slope

*It is judged that students do not know how to compute the slope of a line; more detailed analysis is, therefore, necessary (See pages 3.6 and 3.7).

NOTE: --The results of the competency analyses (the first column) reveal that in the criterion performance, TRANSFER will be a requirement; i.e., students will be given new lines whose styles must be computed.

--The results of the learning analysis that there is likely to be little difficulty learning any of the component skills (discriminations, generalizations, or associations).

COMPETENCY ANALYSIS ▽

c. LEARNING ANALYSIS

level of difficulty in acquiring

d. MODE ANALYSIS

INPUT ①

recall ☐

transfer ☒

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			X
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity			X
No. of properties			X
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic	X		
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

ACTION/ CHAIN

recall ☐

transfer ☒

ASSOCIATIONS

due to ▽	hi	med	lo
No. of associations			X
associative strength of other actions			

GENERALIZATIONS

	hi	med	lo
integrative strength of action			

CHAINS

	hi	med	lo
length of chain			X
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	ub/vocal
recognition				
editing				
production		X		

writing

OUTPUT

recall ☐

transfer ☒

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity			
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic	X		
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

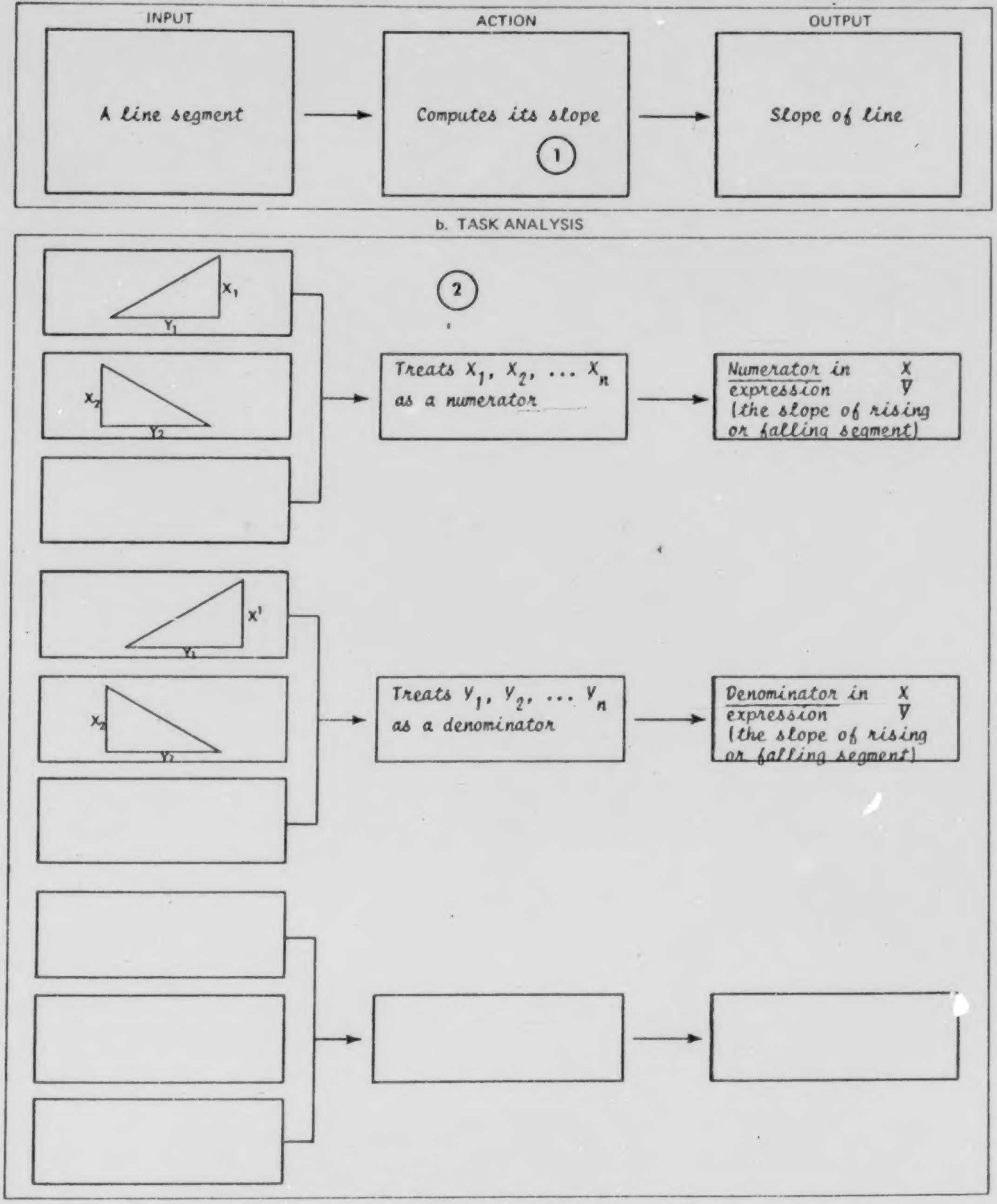
OTHER: Kinaesthetic, smell, taste

NOTE: -- ① As noted by the asterisk on page 3.4, learners do not know how to compute a slope, the ACTION described in the top "task description" row.

-- ② Accordingly, a breakdown of that ACTION into its component skills is made. Part of this breakdown appears in the TASK ANALYSIS section of this diagram.

Form A-5 (4)

for TASK ☐ *STEP* ☐ *Sub-STEP* ☐ a. TASK DESCRIPTION



A line segment → *Computes its slope* → *Slope of line*

Treats $X_1, X_2, \ldots X_n$ as a numerator → *Numerator in expression $\frac{X}{Y}$ (the slope of rising or falling segment)*

Treats $Y_1, Y_2, \ldots Y_n$ as a denominator → *Denominator in expression $\frac{X}{Y}$ (the slope of rising or falling segment)*

COMPETENCY ANALYSIS ▽	c. LEARNING ANALYSIS	d. MODE ANALYSIS

level of difficulty in acquiring

INPUT

recall ☐

transfer ☒

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			X
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity			X
No. of properties			X
No. of inputs			X

		symbolic	verbal	environmental
VISUAL	realistic	X		
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

ACTION/ CHAIN

recall ☐

transfer ☒

ASSOCIATIONS

due to ▽	hi	med	lo
No. of associations			X
associative strength of other actions			

GENERALIZATIONS

	hi	med	lo
integrative strength of action			

CHAINS

	hi	med	lo
length of chain			X
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub/vocal
recognition				
editing				
production		X		

writing

OUTPUT

recall ☐

transfer ☐

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity			
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic	X		
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

Form D.1(1)

LESSON ☐

SPECIFICATION OF OBJECTIVES

	GIVEN	STUDENT WILL	RESULTING IN
	Criterion Inputs ● mode: visual/verbal/etc. ● number of examples from class ● new and/or old examples ● typical/atypical conditions ● availability of performance aids	Criterion Actions ● mode: recognition, editing, production ● alternatives: new and/or old examples ● mode: perceptual/motor/vocal/sub-vocal	Criterion Outputs ● mode: visual/verbal/etc. ● limits, standards ● quantitative: amount /degree/time limits ● qualitative
1.	CRITERION BEHAVIOR *Given any horizontal, rising, or sinking line segment*	*Identifies the sign of the slope*	*Positive, negative, or zero slope correctly identified*
2.	PREPARATORY BEHAVIOR (SUB-CRITERION) *Given any line segment*	*Will compute the slope of the line*	*Slope of line segment*
3.			

Form D.2(2)

LESSON ☐

STATEMENT OF OBJECTIVES
FOR STUDENTS

GIVEN

Inputs

- objects, people, events, words, symbols, etc.
- their properties
- examples:
  - number
  - new or old
- availability of performance aids
- typical/atypical conditions
- problem format
  - e.g., single input vs. multiple choice

YOU WILL

Actions

- select, edit, or produce
- type of action
  - e.g., point to, label, write, classify, etc.

RESULTING IN

Outputs

- objects, events, words, symbols, etc.
- their properties (quantity/quality)
- standards of acceptability

YOU MUST LEARN TO

- distinguish between examples from ___ # ___ input classes
- on the basis of ___ # ___ properties
- see similarity among examples within each of the ___ # ___ input classes
- on the basis of ___ # ___ properties
- associate one of ___ # ___ actions with each one of the ___ # ___ input classes
- exhibit ___ # ___ alternative actions
- exhibit the series of associations in the ___ chain

1.	CRITERION BEHAVIOR Given any horizontal, rising, or sinking line segment	Identifies the sign of the slope	(1) Distinguish between three types of line segments (based on their direction) and associate a value of a "slope" for each type
2.	PREPARATORY BEHAVIOR (SUB-CRITERION) Given any line segment	Will compute the slope of the line	(2) Follow procedures for computing a slope: (a) distinguishing between types of line segments; (b) associating types of line segments with their role in computation (numerator/denominator)
3.			

Form E.1(1)

LESSON ☐ OBJECTIVE ☐

SIMULATION
DECISIONS

a. assessing simulation needs due to →

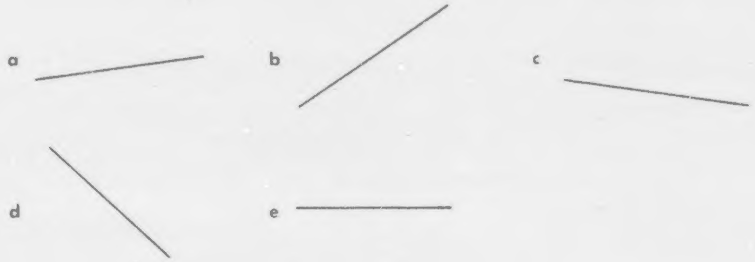
LOGISTICAL CONSIDERATIONS			**INSTRUCTIONAL CONSIDERATIONS**		
downtime	**cost**	**danger**	**sampling**	**standardization**	**manipulation**
N	N	N	N	N	N

b. planning simulation when needed

INPUT types	**PROPERTIES: physical, psychological**	**SIMULATION PLANS: visual, audio, etc.**
people man made objects natural objects events words symbols other	NO SIMULATION NEEDED	
ACTION types		
perceptual motor vocal sub-vocal		
OUTPUT types		
people man made objects natural objects events words symbols other		

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

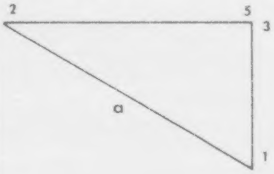
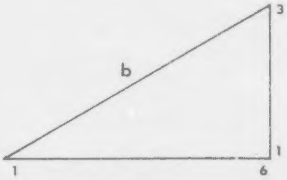
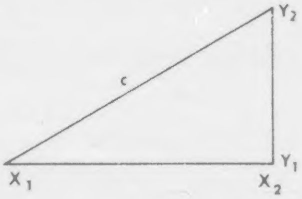
"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
– Instructions – Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	What is the sign of the slope for each of these lines? 
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
– ACTIONS (new/old) •• mode	Gives sign of the slopes

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
– OUTPUT •• answers •• product – Type of Scoring – Standards for Scoring	(a) + (b) + (c) - (d) - (e) 0

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	Compute the slopes of the following lines: (a) line a  (b) line b  (c) line c 
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	Computes the slope (a) $\frac{1-3}{5-2} =$ (b) $\frac{3-1}{6-1} =$ (c) $X_2 - X_1 =$ $Y_2 - Y_1 =$

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	(a) $-\frac{2}{3}$ (b) $\frac{2}{5}$ (c) See above

YOUR ASSIGNMENT

Based on the materials you have just reviewed, formulate your own instructional strategy:

(1) Fill in the FORM which appears on pages 3.14 and 3.15.

(2) Develop an instructional program based on the strategy you have formulated. (If necessary, consult a mathematics text.)

(3) Administer the program and the already developed tests (appearing on pages 3.11 and 3.12) to at least one student (preferably five students).

(4) Sit with the student as he goes through the program. When he makes errors, probe for their sources.

(5) Revise the program in the light of tryout results.

YOUR PRODUCTS WILL INCLUDE:

--completed FORM G.1(2): an instructional strategy

--an instructional program

--protocols of student responses to probes

--program and test data

--a revised program

CONTENTS IN THIS SECTION

FORM NO.	TITLE	PAGE
G.1(2)	Plan instructional strategies	3.14-3.15

Form G.1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE	LEARNING PROBLEMS	PROBLEM SOURCE	MODE
☐ simulation ☐ aids available ☐ two directions 1 transfer 2 delayed basis ☐ recognition mode	INPUTS 3 discriminations 4 generalizations INPUTS & ACTIONS 5 associations 6 chains ACTIONS 7 generalizations ☐ partial proficiency	INPUTS A similarity (dis-) B No. of properties C No. of classes (or, No. members/class) INPUTS & ACTIONS D existing associations E length of chain ACTIONS F integrative strength	INPUTS OUTPU *i* verbal/symbolic *i* *ii* environmental *ii* *iii* audio *iii* *iv* non-realistic *iv* *v* transient *v* ACTIONS *vi* perceptual *viii* vocal *vii* motor *ix* sub-vo

IIA Select Preparatory Practice Progression(s)

UNIT SIZE	MODE	PROMPTING/FADING	CONTENT	FREQUENCY or VARIATION
a. shaping gradual increases in: . . quantity . . quality	b. R/E/P c. visual/verbal d. concrete/abstract e. procedures/principles	f. examples or demonstrations g. verbal cues h. visual cues i. diagramming, overviews	j. principles/procedures k. altered criterion/ criterion l. errors/criterion m. editing/criterion n. backward chaining	o. repetition p. review q. varied examples

		2	A	B	C	D	E	F	*i*	*vi*	*vii*
1	q	o-p	g	g				g-j	e	h	j
3	b-q	i-o-p	g-h-k	i-g	i					h	
4	b-q	i-o-p	g-h	i-g	i-g				g	h	j
3+4	b-i-q	i-o-p	g-h	i-g	i-g				c-d-e-i		
5	b-o	i-o-p			i-g-o-p	b-g-l					
6	a-f-m-n	o-p					a-n				a-m-n
7	j	o-p						g-h-j			j

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION	PROVIDE FEEDBACK	REINFORCE PRACTICE	PROVIDE DELAYED REINFORCEMENT
Advance Organizers . . statement of objectives . . instructions *Cues* . . visual or verbal . . formats, diagrams . . checklists	*Correctness of Answers (Solutions)* . . standard available for comparison . . discrimination practice re: correct outputs	*Intrinsic Reinforcers* . . interesting materials *Extrinsic Reinforcers* . . social . . monetary . . activities . . grades	*Extrinsic Reinforcers* . . social . . monetary . . activities

IB. Design Criterion Practice

	GIVEN as INPUT	**STUDENT WILL take ACTION**	**RESULTING IN OUTPUT**
EXAMPLE(S) properties of additional examples			

IIB. Design Preparatory Practice Progression

PROGRESSION	**given as INPUT**	**student will take ACTION**	**resulting in OUTPUT**
1st			
2nd			
3rd			

IIC. Characterize

MODE		
INPUTS		OUTPUTS
☐ *i*	verbal/symbolic	☐ *i*
☐ *ii*	environmental	☐ *ii*
☐ *iii*	audio	☐ *iii*
☐ *iv*	non-realistic	☐ *iv*
☐ *v*	transient	☐ *v*
	ACTIONS	
☐ *vi*	perceptual	
☐ *vii*	motor	
☐ *viii*	vocal	
☐ *ix*	subvocal	

IV. Select Media

INPUT/OUTPUT DISPLAY

r.	print	s.	environmental	t	devices
r.1	verbal	s.1	people (behavior)	t.1	film, TV
r.2	pictorial	s.2	objects	t.2	slides, projectors
		s.3	events	t.3	simulator
				t.4	audio-tape

	i verbal/symbolic		*ii* environmental		
INPUTS ➤ ▼	*iii* audio	visual	*iii* audio	visual	
				v transient	non-v.
realistic	s.1		s.2 s.3	s.3	s.1 s.2
iv non-realistic	t.4	r.1 r.2 t.1 t.2 t.3	t.4	t.1 t.3	t.2 t.3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u.	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS ➤	*i* verbal/symbolic		*ii* environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non-v.
vi & ix	t.4	u		u		
vii		u	t.4	u	t.1	s.2 t.3
viii	t.4					

DO NOT TURN PAGE
UNTIL AFTER YOU HAVE COMPLETED
YOUR OWN FORM G.1(2)

Form G 1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE

☐ simulation

☐ aids available
☐ two directions

[✓ 1] transfer
2 delayed basis

☐ recognition mode

LEARNING PROBLEMS

INPUTS
[✓ 3] discriminations
[✓ 4] generalizations

INPUTS & ACTIONS
5 associations
[✓ 6] chains

ACTIONS
7 generalizations

☐ partial proficiency

PROBLEM SOURCE

INPUTS
A similarity (dis-)
B No. of properties
C No. of classes (or, No. members/class)

INPUTS & ACTIONS
D existing associations
E length of chain

ACTIONS
F integrative strength

MODE

INPUTS		OUTPUTS
[✓ i]	verbal/symbolic	[✓ i]
ii	environmental	ii
iii	audio	iii
iv	non-realistic	iv
v	transient	v

ACTIONS

vi	perceptual	viii	vocal
[✓ vii]	motor	ix	sub-vocal

writing

IIA. Select Preparatory Practice Progression(s)

UNIT SIZE

a. shaping gradual increases in
quantity
quality

MODE

b. R/E/P
c. visual/verbal
d. concrete/abstract
e. procedures/principles

PROMPTING/FADING

f. examples or demonstrations
g. verbal cues
h. visual cues
i. diagramming, overviews

CONTENT

j. principles/procedures
k. altered criterion/criterion
l. errors/criterion
m. editing/criterion
n. backward chaining

FREQUENCY or VARIATION

o. repetition
p. review
q. varied examples

	1	2	A	B	C	D	E	F	*i*	*vi*	*vii*
1	[✓ q]	o-p	g	g				g-j	[✓ e]	h	i
3	b-q	i-o-p	g-h-k	i-g	i					h	
4	b-q	i-o-p	g-h	i-g	i-g				g	h	i
3+4	[✓ b-i-q]	i-o-p	g-h	i-g	i-g				c-d-e-i		
5	b-o	i-o-p			i-g-o-p	b-g-l					
6	[✓ a-f-m-n]	o-p					a-n				a-m-n
7	i	o-p						g-h-j			i

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION

Advance Organizers
___ statement of objectives
___ instructions

Cues
___ visual or verbal
___ formats, diagrams
___ checklists

PROVIDE FEEDBACK

Correctness of Answers (Solutions)
___ standard available for comparison
___ discrimination practice re: correct outputs

REINFORCE PRACTICE

Intrinsic Reinforcers
___ interesting materials

Extrinsic Reinforcers
___ social
___ monetary
___ activities
___ grades

PROVIDE DELAYED REINFORCEMENT

Extrinsic Reinforcers
___ social
___ monetary
___ activities

. Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
EXAMPLE(S) properties of additional examples	(a) Line segment with positive, negative, or zero slopes (b) One line segment with X and Y values provided	Identify sign of slope Compute the slope of the lines	Correct identification Correct slope

B. Design Preparatory Practice Progression

IIC. Characterize

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT
Diagrams + 1st Recognition items	(a) Elements in "slope" computation (plus answer options) (d) Conditions for +, -, or zero slopes)	(b) Select numerator and denominator in ratio that defines slope (e) Select correct signs for examples used	(c) Correct values for computing slope (f) Correct identification
Without diagrams 2nd	Repeat of above, i.e., recognition practice but without diagrams		
Editing 3rd	(a) Lines correctly or incorrectly identified for sign of slope (b) Problem model + new problems	(b) Edits (e) Computes slopes	(c) Change in sign identification (f) Correct slopes

MODE

INPUTS		OUTPUTS
☐ *i*	verbal/symbolic	☐ *i*
☐ *ii*	environmental	☐ *ii*
☐ *iii*	audio	☐ *iii*
☐ *iv*	non-realistic	☐ *iv*
☐ *v*	transient	☐ *v*
	ACTIONS	
☐ *vi*	perceptual	
☐ *vii*	motor	
☐ *viii*	vocal	
☐ *ix*	subvocal	

. Select Media

NPUT/OUTPUT DISPLAY

r.	print	s.	environmental	t.	devices
.1	verbal	s.1	people (behavior)	t.1	film, TV
.2	pictorial	s.2	objects	t.2	slides, projectors
		s.3	events	t.3	simulator
				t.4	audio-tape

	i verbal/symbolic		*ii* environmental		
NPUTS ► ▼	*iii* audio	visual	*iii* audio	visual v. transient	non-v.
realistic	s.1		s.2 s.3	s.3	s.1 s.2
iv non-realistic	t.4	r.1 [✓ r.2] t.1 t.2 t.3	t.4	t.1 t.3	t.2 t.3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u.	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS►	*i* verbal/symbolic		*ii* environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non-v.
vi & ix	t.4	u		u		
vii		[✓ u]	t.4	u	t.1	s.2 t.3
viii	t.4					

FINAL EXERCISE #4

DEVELOPING TESTS

NOT TO BE PERFORMED UNTIL ALL WORKBOOK EXERCISES ASSOCIATED WITH HANDBOOK SECTION "F" HAVE BEEN COMPLETED.

FINAL EXERCISE #4:
Developing Tests

Before doing this exercise, you should have completed the following tasks:

(1) Read HANDBOOK Section "F": DEVELOP DIAGNOSTIC AND EVALUATIVE TESTS

and

(2) Do the WORKBOOK exercises associated with Section "F."

Your assignment in this exercise is to perform TASK F: "developing criterion tests." As a basis for performing this task, starting on the next page you will be given completed results for prior tasks in the materials development process.

Following your review of these results, you are to develop your own tests using the FORMS which appear in the section which begins on page 4.9.

Before doing the "test development" assignment, review the completed FORMS which contain the results of PRIOR DEVELOPMENT TASKS.

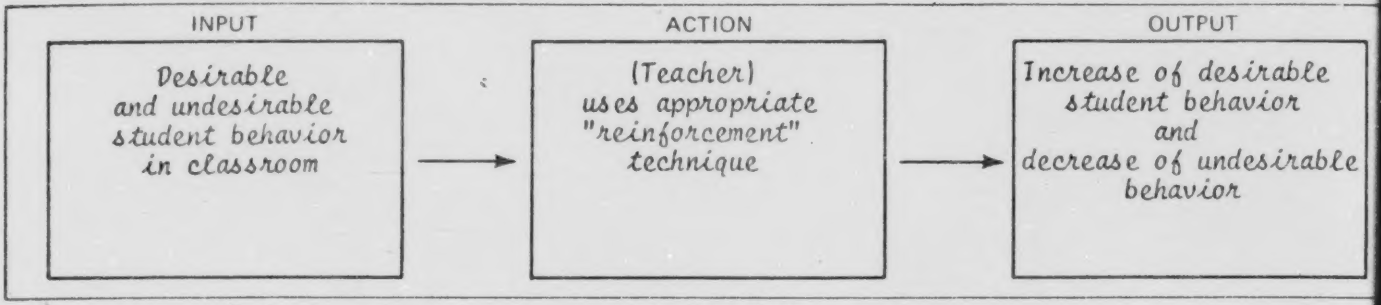
RESULTS OF PRIOR DEVELOPMENT TASKS
WHICH ARE MADE AVAILABLE TO YOU

TASK LABEL	TASK TITLE	FORM NO.
B	Task analysis, learning analysis, competency analysis, and mode analysis	A.5(4)
D	Statement of objectives	D.2(1) and D.2(2)
E	Simulation plans	E.1(1)

Form A-5 (4)

for TASK ☐ *STEP* ☐ *Sub-STEP* ☐

a. TASK DESCRIPTION


INPUT

Desirable and undesirable student behavior in classroom

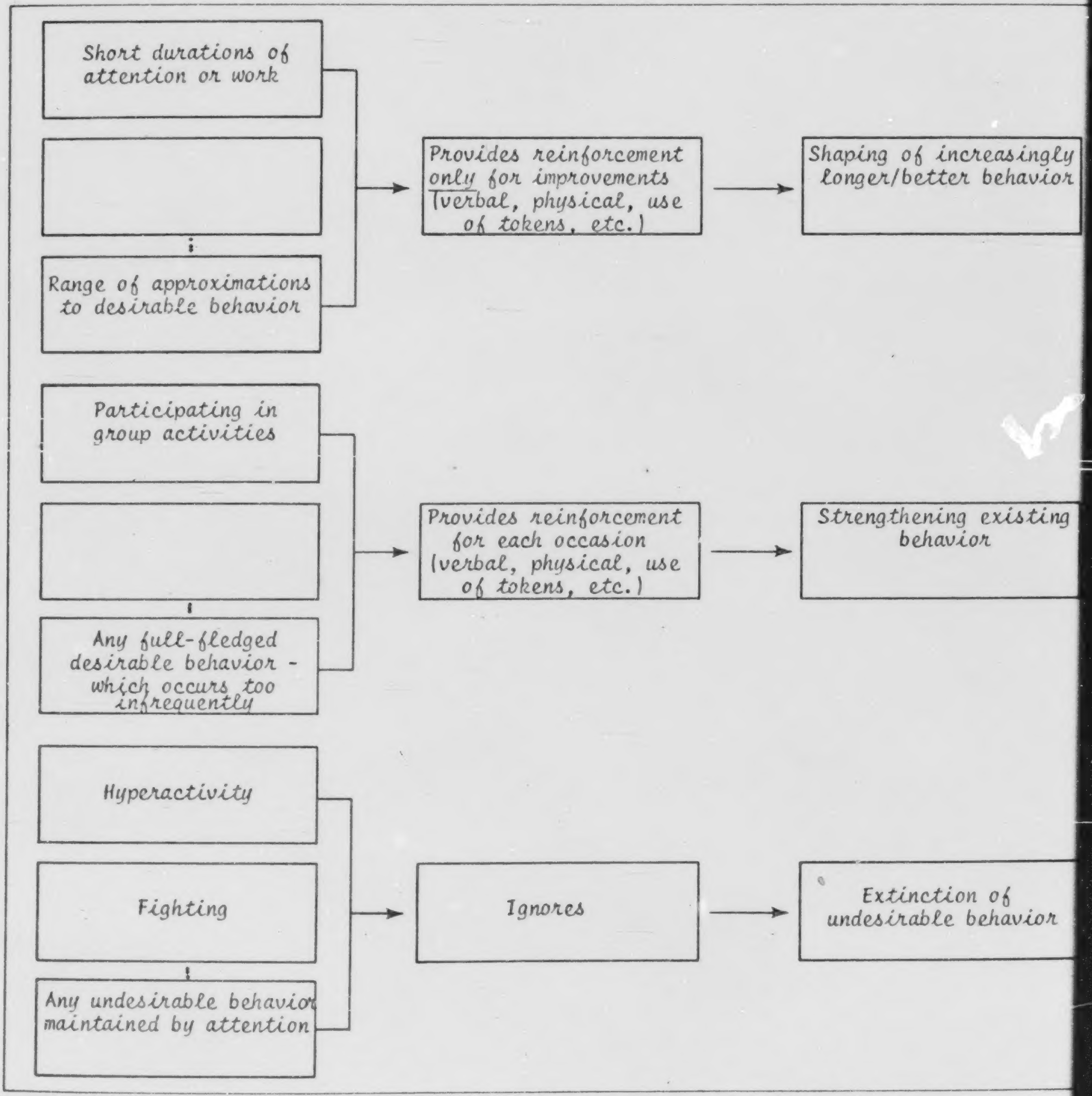
ACTION

(Teacher) uses appropriate "reinforcement" technique

OUTPUT

Increase of desirable student behavior and decrease of undesirable behavior

b. TASK ANALYSIS


Short durations of attention or work

Range of approximations to desirable behavior

Provides reinforcement only for improvements (verbal, physical, use of tokens, etc.)

Shaping of increasingly longer/better behavior

Participating in group activities

Any full-fledged desirable behavior - which occurs too infrequently

Provides reinforcement for each occasion (verbal, physical, use of tokens, etc.)

Strengthening existing behavior

Hyperactivity

Fighting

Any undesirable behavior maintained by attention

Ignores

Extinction of undesirable behavior

COMPETENCY ANALYSIS ▽	c. LEARNING ANALYSIS	d. MODE ANALYSIS

level of difficulty in acquiring

INPUT

recall ☐

transfer ☒

DISCRIMINATIONS

between full-fledged desirable and approximations

due to ▽	hi	med	lo
similarity		X	
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity	X		
No. of properties			X
No. of inputs	X		

		symbolic	verbal	environmental
VISUAL	realistic			X
	reproduced/ fabricated			
AUDIO	realistic		X	
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

ACTION/ CHAIN

recall ☐

transfer ☒

ASSOCIATIONS

due to ▽	hi	med	lo
No. of associations			
associative strength of other actions	X		

tendency to punish for undesirable behaviors and to ignore desirable behavior

GENERALIZATIONS

	hi	med	lo
integrative strength of action			X

CHAINS

	hi	med	lo
length of chain			X
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub/vocal
recognition				
editing				
production		X	X	

OUTPUT

recall ☐

transfer ☒

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity		X	
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity		X	
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic			X
	reproduced/ fabricated			
AUDIO	realistic		X	
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

Form D.1(1)

LESSON ☐

SPECIFICATION OF OBJECTIVES

	GIVEN	STUDENT WILL	RESULTING IN
	Criterion Inputs ● mode: visual/verbal/etc. ● number of examples from class ● new and/or old examples ● typical/atypical conditions ● availability of performance aids	Criterion Actions ● mode: recognition, editing, production ● alternatives: new and/or old examples ● mode: perceptual/motor/vocal/sub-vocal	Criterion Outputs ● mode: visual/verbal/etc. ● limits, standards ● quantitative: amount /degree/time limits ● qualitative
1.	CRITERION Any example of student behavior (desirable or undesirable) occurring in an actual classroom; behavior can be verbal or physical	Teacher will apply the appropriate technique (shaping, reinforcing, or ignoring): -In a correct way -For correct durations (over time)	Changes in student behavior: -Increased strength or frequency of desirable behavior -Decreased frequency of undesirable behavior
2.	~~PREPARATORY~~ (SUB-CRITERION) A verbal description of problem behaviors	Teacher will verbally identify properties or attributes that call for a particular management strategy; will describe the details of carrying out the strategy (conditions)	Correct verbal discussion of problem and ways of dealing with it
3.			

Form D.2(2)

LESSON ☐

STATEMENT OF OBJECTIVES
FOR STUDENTS

	GIVEN	YOU WILL	YOU MUST LEARN TO
	Inputs ● objects, people, events, words, symbols, etc. ● their properties ● examples: number, new or old ● availability of performance aids ● typical/atypical conditions ● problem format e.g., single input vs. multiple choice	Actions ● select, edit, or produce ● type of action e.g., point to, label, write, classify, etc. **RESULTING IN** Outputs ● objects, events, words, symbols, etc. ● their properties (quantity/quality) ● standards of acceptability	● distinguish between examples from ___ # ___ input classes ● on the basis of ___ # ___ properties ● see similarity among examples within each of the ___ # ___ input classes ● on the basis of ___ # ___ properties ● associate one of ___ # ___ actions with each one of the ___ # ___ input classes ● exhibit ___ # ___ alternative actions ● exhibit the series of associations in the ___ chain
1.	CRITERION Any example of student behavior (desirable or undesirable) occurring in an actual classroom; behavior can be verbal or physical	Teacher will apply the appropriate technique (shaping, reinforcing, or ignoring): -In a correct way -For correct durations (over time)	To distinguish between three types of problem behavior; the distinction is based first of all on: (a) whether it is desirable behavior or undesirable behavior; (b) how frequently it occurs; (c) if desirable, whether it is at full strength or an approximation
2.	PREPARATORY (SUB-CRITERION) A verbal description of problem behaviors	Teacher will verbally identify properties or attributes that call for a particular management strategy; will describe the details of carrying out the strategy (conditions)	Then you will have to learn to apply a different technique for each of the three types of problems
3.			

Form E.1(1)

LESSON ☐ OBJECTIVE ☐

SIMULATION
DECISIONS

a. assessing simulation needs due to →

LOGISTICAL CONSIDERATIONS			INSTRUCTIONAL CONSIDERATIONS		
downtime	cost	danger	sampling	standardization	manipulation
N	N	A	A	A	A

b. planning simulation when needed

INPUT types	PROPERTIES: physical, psychological	SIMULATION PLANS: visual, audio, etc.
people man made objects natural objects events words symbols other	Desirable student behavior: ••Only an approximation ••Frequency of occurrence Undesirable student behavior	-Verbal descriptions ✓ -Filmed examples -Role-playing (actual students, or fellow teacher trainees) -Actual classroom ✓
ACTION types		
perceptual motor vocal sub-vocal	Verbally or physically delivers reinforcement	-Paper and pencil ✓ -Oral responses ✓ -Acting out (in role-play situation)
OUTPUT types		
people man made objects natural objects events words symbols other	Changes in student behavior: ••Frequency ••Approximation to ideal	-Verbal feedback ✓ -Role-play feedback -Actual feedback (student behavior) ✓

YOUR ASSIGNMENT

Based on the materials you have just reviewed, develop your own tests:

(1) Fill in the test development FORMS which appear on the next several pages (using as many of them as you feel you need);

(2) Formulate an instructional strategy (basing it on all completed results). Fill in the instructional strategy FORM.

(3) (OPTIONAL) As time permits, carry out the remaining TASKS in the instructional materials development process (i.e., develop a program, administer it and the tests you have developed, and revise the program in the light of tryout results).

YOUR PRODUCTS WILL INCLUDE:*

--completed FORMS F.2(1): Tests

--completed FORM G.1(2): Instructional Strategy

**the minimum requirement*

CONTENTS IN THIS SECTION

FORM NO.	TITLE	PAGE
F.2(1)	Test development	4.10-4.13
G.1(2)	Plan instructional strategies	4.14-4.15

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem ••INPUTS (new/old) ••AIDS (when applicable)	
••ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) ••mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT ••answers ••product — Type of Scoring — Standards for Scoring	

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
– Instructions – Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
– ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
– OUTPUT •• answers •• product – Type of Scoring – Standards for Scoring	

Form G.1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE

☐ simulation

☐ aids available
☐ two directions

1 transfer
2 delayed basis

☐ recognition mode

LEARNING PROBLEMS

INPUTS
3 discriminations
4 generalizations

INPUTS & ACTIONS
5 associations
6 chains

ACTIONS
7 generalizations

☐ partial proficiency

PROBLEM SOURCE

INPUTS
A similarity (dis-)
B No. of properties
C No. of classes (or, No. members/class)

INPUTS & ACTIONS
D existing associations
E length of chain

ACTIONS
F integrative strength

MODE

INPUTS OUTPU

i verbal/symbolic *i*
ii environmental *ii*
iii audio *iii*

iv non-realistic *iv*
v transient *v*

ACTIONS
vi perceptual *viii* voca
vii motor *ix* sub-v

IIA. Select Preparatory Practice Progression(s)

UNIT SIZE

a. shaping gradual increases in:
.. quantity
.. quality

MODE

b. R/E/P
c. visual/verbal
d. concrete/abstract
e. procedures/principles

PROMPTING/FADING

f. examples or demonstrations
g. verbal cues
h. visual cues
i. diagramming, overviews

CONTENT

j. principles/procedures
k. altered criterion/criterion
l. errors/criterion
m. editing/criterion
n. backward chaining

FREQUENCY or VARIATION

o. repetition
p. review
q. varied examples

		2	A	B	C	D	E	F	*i*	*vi*	*vii*
1	q	o-p	g	g				g-j	e	h	j
3	b-q	i-o-p	g-h-k	i-g	i					h	
4	b-q	i-o-p	g-h	i-g	i-g				g	h	j
3+4	b-i-q	i-o-p	g-h	i-g	i-g				c-d-e-i		
5	b-o	i-o-p			i-g-o-p	b-g-l					
6	a-f-m-n	o-p					a-n				a-m-n
7	i	o-p						g-h-j			j

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION

Advance Organizers
.. statement of objectives
.. instructions

Cues
.. visual or verbal
.. formats, diagrams
.. checklists

PROVIDE FEEDBACK

Correctness of Answers (Solutions)
.. standard available for comparison
.. discrimination practice re: correct outputs

REINFORCE PRACTICE

Intrinsic Reinforcers
.. interesting materials

Extrinsic Reinforcers
.. social
.. monetary
.. activities
.. grades

PROVIDE DELAYED REINFORCEMENT

Extrinsic Reinforcers
.. social
.. monetary
.. activities

B. Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
EXAMPLE(S) properties of additional examples			

IB. Design Preparatory Practice Progression

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT
1st			
2nd			
3rd			

IIC. Characterize

MODE		
INPUTS		OUTPUTS
i	verbal/symbolic	*i*
ii	environmental	*ii*
iii	audio	*iii*
iv	non-realistic	*iv*
v	transient	*v*
	ACTIONS	
vi	perceptual	
vii	motor	
viii	vocal	
ix	subvocal	

V. Select Media

INPUT/OUTPUT DISPLAY

r.	print	s.	environmental	t.	devices
r.1	verbal	s.1	people (behavior)	t.1	film, TV
r.2	pictorial	s.2	objects	t.2	slides, projectors
		s.3	events	t.3	simulator
				t.4	audio-tape

	i verbal/symbolic		*ii* environmental		
INPUTS ➤ ▼	*iii* audio	visual	*iii* audio	visual v transient	non-v.
realistic	s.1		s.2 s.3	s.3	s.1 s.2
iv non-realistic	t.4	r.1 r.2 t.1 t.2 t.3	t.4	t.1 t.3	t.2 t.3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u.	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS➤	*i* verbal/symbolic		*ii* environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non-v.
vi & ix	t.4	u		u		
vii		u	t.4	u	t.1	s.2 t.3
viii	t.4					

DO NOT TURN PAGE
UNTIL YOU HAVE COMPLETED THE
FORMS ON PAGES 4.10-4.15

AFTER you have developed your own tests and have formulated an instructional strategy, refer to the suggested solutions which appear on the next several pages.

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	Case Study: "Never waiting to be called on, Johnny always blurts out answers questions. Mrs. Jones then usually asks others if Johnny's answers are right or wrong. Or, she may herself tell Johnny whether he is right or wrong." What should Mrs. Jones do to get Johnny to stop blurting out answers and to raise his hand to be called on?
•• ANSWER OPTIONS (when applicable)	

(Other comparable items - four in number)

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	Write a comparable answer: "Mrs. Jones should ignore Johnny when he blurts out answers and call on someone else. When he does raise his hand, she should call on him sometimes."

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	See above for answer

Form F 2(1)

LESSON ☐ OBJECTIVE ☐ FORM FOR TEST DEVELOPMENT

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	Case Study: "Only on occasion does Sally volunteer to participate in group activities. Her teacher would like her to do this more often." What should her teacher do to bring this about?
•• ANSWER OPTIONS (when applicable)	

(Other comparable items - four in number)

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	Written answer: "The teacher should reinforce (a reinforcer appropriate to Sally) each instance in which Sally does volunteer."

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	See above for answer.

Form F.2(1)

LESSON ☐ OBJECTIVE ☐ FORM FOR TEST DEVELOPMENT

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	*Case Study:* *"Clara will concentrate on an assignment for no more than a minute or two at a time. Her teacher would like to get her to work for a whole class period."* *What should her teacher do?*
•• ANSWER OPTIONS (when applicable)	

(Other comparable items - four in number)

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	*Written answer:* *"Make a contract with Clara for gradually longer and longer durations. Come to agreement with her about a reinforcement and deliver the reinforcement only if contract terms are met."*

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	*See above for answer.*

Form G 1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE	LEARNING PROBLEMS	PROBLEM SOURCE	MODE
[✓ ☐] simulation ☐ aids available ☐ two directions [✓ 1] transfer 2 delayed basis ☐ recognition mode	INPUTS [✓ 3] discriminations [✓ 4] generalizations INPUTS & ACTIONS [✓ 5] associations 6 chains ACTIONS 7 generalizations ☐ partial proficiency	INPUTS [✓ A] similarity (dis-) B No. of properties [✓ C] No. of classes (or, No. members/class) INPUTS & ACTIONS [✓ D] existing associations E length of chain ACTIONS F integrative strength	INPUTS / OUTPUTS *i* verbal/symbolic *i* [✓ *ii*] environmental [✓ *ii*] *iii* audio *iii* *iv* non-realistic *iv* [✓ *v*] transient *v* ACTIONS *vi* perceptual [✓ *viii*] vocal *vii* motor *ix* sub-vocal

IIA. Select Preparatory Practice Progression(s)

UNIT SIZE	MODE	PROMPTING/FADING	CONTENT	FREQUENCY or VARIATION
a. shaping gradual increases in quantity quality	b. R/E/P c. visual/verbal d. concrete/abstract e. procedures/principles	f. examples or demonstrations g. verbal cues h. visual cues i. diagramming, overviews	j. principles/procedures k. altered criterion/criterion l. errors/criterion m. editing/criterion n. backward chaining	o. repetition p. review q. varied examples

		2	A	B	C	D	E	F	*i*	*vi*	*vii*
1	q	o-p	g	g				g-j	e	h	j
3	b-q	i-o-p	g-h-k	i-g	i					h	
4	b-q	i-o-p	g-h	i-g	i-g				g	h	j
3+4	[✓ b-i-q]	i-o-p	[✓ g-h]	i-g	i-g				c-d-e-i		
5	[✓ b-o]	i-o-p			i-g-o-p	[✓ b-g-l]					
6	a-f-m-n	o-p					a-n				a-m-n
7	j	o-p						g-h-j			j

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION	PROVIDE FEEDBACK	REINFORCE PRACTICE	PROVIDE DELAYED REINFORCEMENT
Advance Organizers . statement of objectives . instructions *Cues* . visual or verbal . formats, diagrams . checklists	*Correctness of Answers (Solutions)* . standard available for comparison . discrimination practice re: correct outputs	*Intrinsic Reinforcers* . . interesting materials *Extrinsic Reinforcers* . . social . . monetary . . activities . . grades	*Extrinsic Reinforcers* ✓ . . social . . monetary . . activities Reinforcements for teachers to get them to use "reinforcement" with their students

IB. Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
EXAMPLE(S) properties of additional examples	Problem behavior occurring in an actual classroom which requires: shaping, reinforcement, or ignoring; e.g., inattentive ness, talking to peers (infrequently), or hyperactivity	Teachers will take appropriate steps	Changes in the behavior of their students

IIB. Design Preparatory Practice Progression

IIC. Characterize

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT
1st	Paper-and-pencil case studies; recognition level; discriminating between types of problems	Select from options an identification of problem types	Correct identification
2nd	Case studies: problems of each of the three types	Select and edit the right techniques for problem types	Description of appropriate implementation technique
3rd	Instructions to guided classroom exercise - example of problem type to be selected	Manage selected problem for period of week	Record of resu s of changes in student's behavior and record of what teacher did

MODE

INPUTS — OUTPUTS
[✓ i] verbal/symbolic [✓ i]
☐ ii environmental ☐ ii
☐ iii audio ☐ iii
☐ iv non-realistic ☐ iv
☐ v transient ☐ v

ACTIONS
☐ vi perceptual
[✓ vii] motor
☐ viii vocal
☐ ix subvocal

IV. Select Media

INPUT/OUTPUT DISPLAY

r.	print	s.	environmental	t.	devices
r.1	verbal	s.1	people (behavior)	t.1	film, TV
r.2	pictorial	s.2	objects	t.2	slides, projectors
		s.3	events	t.3	simulator
				t.4	audio-tape

	i verbal/symbolic		ii environmental		
INPUTS ► ▼	iii audio	visual	iii audio	visual v transient	visual non-v
realistic	s.1		s.2 s.3	s.3	s.1 s.2
iv non-realistic	t.4	[✓ r.1] r.2 t.1 t.2 t.3	t.4	t.1 t.3	t.2 t.3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u.	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS ►	i verbal/symbolic		ii environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non-v.
vi & ix	t.4	u		u		
vii		[✓ u]	t.4	u	t.1	s.2 t.3
viii	t.4					

FINAL EXERCISE #5

PLANNING SIMULATION

NOT TO BE PERFORMED UNTIL ALL WORKBOOK EXERCISES ASSOCIATED WITH HANDBOOK SECTION "E" HAVE BEEN COMPLETED.

FINAL EXERCISE #5:
Planning Simulation

Before doing this exercise, you should have completed the following tasks:

(1) Read HANDBOOK Section "E": PLAN SIMULATION

and

(2) Do the WORKBOOK exercises associated with Section "E."

Your assignment in this exercise is to perform TASK E: "assessing simulation needs and planning simulation", As a basis for performing this task, starting on the next page you will be given completed results for prior tasks in the materials development process:

Following your review of these results, you are to develop your simulation plans using the FORM which appears in the section beginning on page 5.9.

Before doing the "simulation" assignment, review the completed FORMS which contain the results of PRIOR DEVELOPMENT TASKS.

RESULTS OF PRIOR DEVELOPMENT TASKS
WHICH ARE MADE AVAILABLE TO YOU

TASK LABEL	TASK TITLE	FORM NO.
B	Task analysis, learning analysis, competency analysis, and mode analysis	A.5(4)
D	Statement of objectives	D.2(1) and D.2(2)

Form A-5 (4)

for TASK ☐ *STEP* ☐ *Sub-STEP* ☐

a. TASK DESCRIPTION

INPUT	ACTION	OUTPUT
Condition of liver and/or spleen	Medical student diagnoses condition	Diagnosis of enlargement or presence of masses

b. TASK ANALYSIS

 Normal liver and spleen 	Palpates*	Identification of no enlargement or masses
Enlarged liver or spleen Masses in liver or spleen 	Palpates	Identification of masses or enlargement

*"palpates": feels with his hands

COMPETENCY ANALYSIS ▽

c. LEARNING ANALYSIS

level of difficulty in acquiring

d. MODE ANALYSIS

INPUT

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity		X	
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity		X	
No. of properties			X
No. of inputs		X	

		symbolic	verbal	environmental
VISUAL	realistic			X
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: [✓ Kinaesthetic] smell, taste

recall ☐

transfer ☐

ACTION CHAIN

ASSOCIATIONS

due to ▽	hi	med	lo
No. of associations			X
associative strength of other actions			

GENERALIZATIONS

	hi	med	lo
integrative strength of action			

CHAINS

	hi	med	lo
length of chain			X
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub-vocal
recognition				
editing				
production	X	X		

touch

recall ☐

transfer ☐

OUTPUT

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity			
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic			
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: [✓ Kinaesthetic] smell, taste

recall ☐

transfer ☐

Form D 2(1)

LESSON ☐

SPECIFICATION OF OBJECTIVES

	GIVEN	STUDENT WILL	RESULTING IN
	Criterion Inputs ● mode: visual/verbal/etc. ● number of examples from class ● new and/or old examples ● typical/atypical conditions ● availability of performance aids	Criterion Actions ● mode: recognition, editing, production ● alternatives: new and/or old examples ● mode: perceptual/motor/vocal/sub-vocal	Criterion Outputs ● mode: visual/verbal/etc. ● limits, standards ● quantitative: amount /degree/time limits ● qualitative
1.	CRITERION BEHAVIOR Given an enlarged or normal liver or spleen - or liver or spleen with masses in it	Will palpate and identify condition	Identification of presence or absence of enlargement or masses
2.			
3.			

Form D.2(2)

LESSON ☐

STATEMENT OF OBJECTIVES
FOR STUDENTS

	GIVEN	YOU WILL	YOU MUST LEARN TO
	Inputs • objects, people, events, words, symbols, etc. • their properties • examples number new or old • availability of performance aids • typical/atypical conditions • problem format e.g., single input vs. multiple choice	Actions • select, edit, or produce • type of action e.g., point to, label, write, classify, etc. RESULTING IN Outputs • objects, events, words, symbols, etc. • their properties (quantity/quality) • standards of acceptability	• distinguish between examples from # input classes • on the basis of # properties • see similarity among examples within each of the # input classes • on the basis of # properties • associate one of # actions with each one of the # input classes • exhibit # alternative actions • exhibit the series of associations in the chain
1.	CRITERION BEHAVIOR Given an enlarged or normal liver or spleen - or liver or spleen with masses in it	Will palpate and identify condition	Identification of presence or absence of enlargement or masses
2.			
3.			

YOUR ASSIGNMENT

Based on the materials you have just reviewed, assess simulation needs and plan it (if necessary).

(1) Fill in the simulation FORM which appears on the next page.

(2) Develop criterion tests (using the test development FORM which also appears in this section).

(3) (OPTIONAL) As time permits carry out the remaining TASKS in the development process (all the way through to the tryout and review of an instructional program).

YOUR PRODUCTS WILL INCLUDE:*

--completed FORM E.1(1): Simulation plans

--completed FORM F.2(1): Tests

* *as a minimum requirement.*

CONTENTS IN THIS SECTION

FORM NO.	TITLE	PAGE
E.1(1)	Simulation decisions	5.10
F.2(1)	Test development	5.11-5.12

Form E.1(1)

SIMULATION DECISIONS

LESSON ☐ OBJECTIVE ☐

a. assessing simulation needs due to →

LOGISTICAL CONSIDERATIONS			INSTRUCTIONAL CONSIDERATIONS		
downtime	cost	danger	sampling	standardization	manipulation
☐	☐	☐	☐	☐	☐

b. planning simulation when needed

INPUT types	PROPERTIES. physical, psychological	SIMULATION PLANS: visual, audio, etc.
people man made objects natural objects events words symbols other		

ACTION types		
perceptual motor vocal sub-vocal		

OUTPUT types		
people man made objects natural objects events words symbols other		

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
– Instructions – Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
– ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
– OUTPUT •• answers •• product – Type of Scoring – Standards for Scoring	

DO NOT TURN PAGE UNTIL
YOU HAVE COMPLETED
FILLING OUT THE FORMS
ON THE PRECEDING PAGES.

Form E.1(1)

SIMULATION DECISIONS

LESSON ☐ OBJECTIVE ☐

a. assessing simulation needs due to

LOGISTICAL CONSIDERATIONS			INSTRUCTIONAL CONSIDERATIONS		
downtime	cost	danger	sampling	standardization	manipulation
N	N	A	A	A	A

-It would take a long time to run into range of practice situations

b. planning simulation when needed

INPUT types	PROPERTIES: physical, psychological	SIMULATION PLANS: visual, audio, etc.
people man made objects natural objects events words symbols other	-Enlargement -Presence of masses	-Verbal descriptions -Rubberized mock-ups (with varying degrees of enlargement or absence of it built into dummies) (masses) ✓ -Paid actors (for normal conditions)

ACTION types		
perceptual motor vocal sub-vocal	-Applying deep pressure	

OUTPUT types		
people man made objects natural objects events words symbols other	-Diagnosis or evaluation	

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ABSTRACT

This document, one of five volumes comprising a training program in instructional materials development designed for educational research and development personnel, provides practice in all the major tasks involved in the program. These final exercises provide an opportunity to put together component activities and practice them in combination just as in a real situation. Two types of materials are provided: (a) materials to work on directly and (b) materials representing completed prior analyses. This volume is divided into nine final tasks: (a) making revisions in an instructional program; (b) developing an instructional program; (c) formulating an instructional strategy; (d) developing tests; (e) planning simulation; (f) stating objectives, (g) analyzing criterion behavior, and (h) developing an instructional program through the complete cycle. (PD)

ED 092515

[redacted]

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A Technology For Developing Instructional Materials

5 FINAL EXERCISES

A. PLAN STUDY OF CRITERION BEHAVIORS

B. COLLECT AND ANALYZE DATA ABOUT CRITERION BEHAVIORS

C. SEQUENCE AND GROUP CRITERION BEHAVIORS

D. STATE CRITERION AND PREPARATORY OBJECTIVES

E. PLAN SIMULATION BASED ON INSTRUCTIONAL AND LOGISTICAL NEED

F. DEVELOP DIAGNOSTIC AND EVALUATIVE TESTS

G. FORMULATE INSTRUCTIONAL STRATEGIES

H. PLAN ACCOMMODATION OF INDIVIDUAL DIFFERENCES

I. DEVELOP INSTRUCTIONAL MATERIALS

J. EVALUATE INSTRUCTIONAL MATERIALS

AUTHOR:

George L. Gropper

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A Technology For Developing Instructional Materials

5 FINAL EXERCISES

Volume Titles:

1. USER'S MANUAL
2. ORIENTATION
3. HANDBOOK
4. WORKBOOK
5. FINAL EXERCISES

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AUTHOR:

George L. Gropper

Published by:

AMERICAN INSTITUTES
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Pittsburgh, Pennsylvania

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March,1973

VOLUMES IN THIS SERIES

1. USER'S MANUAL
2. ORIENTATION
3. HANDBOOK
   (eleven sub-volumes)
4. WORKBOOK
5. FINAL EXERCISES

FOREWORD

This FINAL EXERCISES volume is but one of five major volumes which comprise a training program in instructional materials development designed for educational R&D personnel. It was prepared to provide personnel taking the program practice in all the major tasks involved in the instructional materials development process.

The USER'S MANUAL describes the role each of the five major volumes is designed to play. It also prescribes the sequence in which each of the separate volumes is to be used. Personnel taking this program are, therefore, urged to read the instructions contained in the USER'S MANUAL before attempting to use this or any of the other separate volumes.

ACKNOWLEDGMENTS

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U.S.O.E. sponsorship does not in any way imply official endorsement of the views expressed in this volume.

The author is indebted to Miss Kathleen Gubala for her tireless preparation of the complex manuscript required by this FINAL EXERCISES volume.

George L. Gropper
March 1973

GENERAL INSTRUCTIONS

Each of the ten major TASKS in the materials development process (TASKS A-J) involves several STEPS and Sub-STEPS. WORKBOOK exercises gave you the opportunity to practice executing separate Sub-STEPS and, in some instances, just portions of a Sub-STEP. In the FINAL EXERCISES which appear in this volume you have the opportunity to put together these component activities and to practice them in combination, just as you would in a real, job-like situation.

Each FINAL EXERCISE provides you with two types of materials: (1) the materials you are to work on directly; and (2) the materials representing completed prior analyses. For example, when you are required to formulate an instructional strategy (TASK G), you will be given the results of all the necessary prior analysis on which you are to base your formulations (i.e. task analyses, statements of objectives, tests, etc.). Much of this prior analysis is summarized and condensed on specially prepared forms.

The training you are receiving is sequenced in a backward order, i.e. you are starting with TASK J rather than with TASK A. Therefore, when you are given the results of prior TASKS in the development process, you will not have learned how to perform prior tasks and cannot be expected to make *full* use of all the information provided.

In earlier exercises brief orienting instructions are provided to call your attention to specific information available on the completed FORMS. You will need merely to familiarize yourself with the information on the FORMS to which the orienting instructions call attention. The rest of the information on the FORMS, particularly when shorthand symbols are used, may be ignored until such time as you have had practice in using it.

The FORMS are presented in their entirety often before you are able to use all the information on them. They are intended to serve as models which, when you are subsequently given practice relevant to each prior task using the forms, you will be better prepared to follow yourself.

SCHEDULE

AFTER COMPLETING ALL WORKBOOK EXERCISES IN SECTION:	DO FINAL EXERCISE #:	TASK TITLE:
J	1	MAKING REVISIONS IN AN INSTRUCTIONAL PROGRAM
I	2	DEVELOPING AN INSTRUCTIONAL PROGRAM
G	3	FORMULATING AN INSTRUCTIONAL STRATEGY
F	4	DEVELOPING TESTS
E	5	PLANNING SIMULATION
D	6	STATING OBJECTIVES
B	7 & 8	ANALYZING CRITERION BEHAVIOR

=

After completing FINAL EXERCISES 1-8	9	THE COMPLETE CYCLE IN DEVELOPING AN INSTRUCTIONAL PROGRAM TASKS B-J

FINAL EXERCISE #1

MAKING REVISIONS IN AN INSTRUCTIONAL PROGRAM

NOT TO BE PERFORMED UNTIL ALL WORKBOOK EXERCISES ASSOCIATED WITH HANDBOOK SECTION "J" HAVE BEEN COMPLETED.

FINAL EXERCISE #1:
Making Revisions in an Instructional Program

Before doing this exercise, you should have completed the following tasks:

(1) Read HANDBOOK Section "J": EVALUATE INSTRUCTIONAL MATERIALS:

and

(2) Do the WORKBOOK exercises associated with Section "J."

Your assignment in this exercise is to perform TASK J: "making revisions in an instructional program".

As a basis for performing this task, starting on page 1.3 you will be given completed results for prior TASKS in the materials development process which you are to review briefly.

Following your review of these results, you are to revise the instructional program which appears in the section beginning on page 1.13.

The development of the program which you are expected to revise was based on the results of prior TASKS in the development process. This section contains those results.

Before proceeding to the "revisions" assignment on page 1.13, briefly review the completed FORMS which contain the results of the various PRIOR DEVELOPMENT TASKS.

RESULTS OF PRIOR DEVELOPMENT TASKS
WHICH ARE MADE AVAILABLE TO YOU

TASK LABEL	TASK TITLE	FORM NO.
B	Task analysis, learning analysis, competency analysis, and mode analysis	A.5(4)
D	Statement of objectives	D.2(1) and D.2(2)
E	Simulation plans	E.1(1)
F	Test development	F.2(1)
G	Instructional strategies	G.1(2)

Review the results of these prior TASKS beginning on the next page.

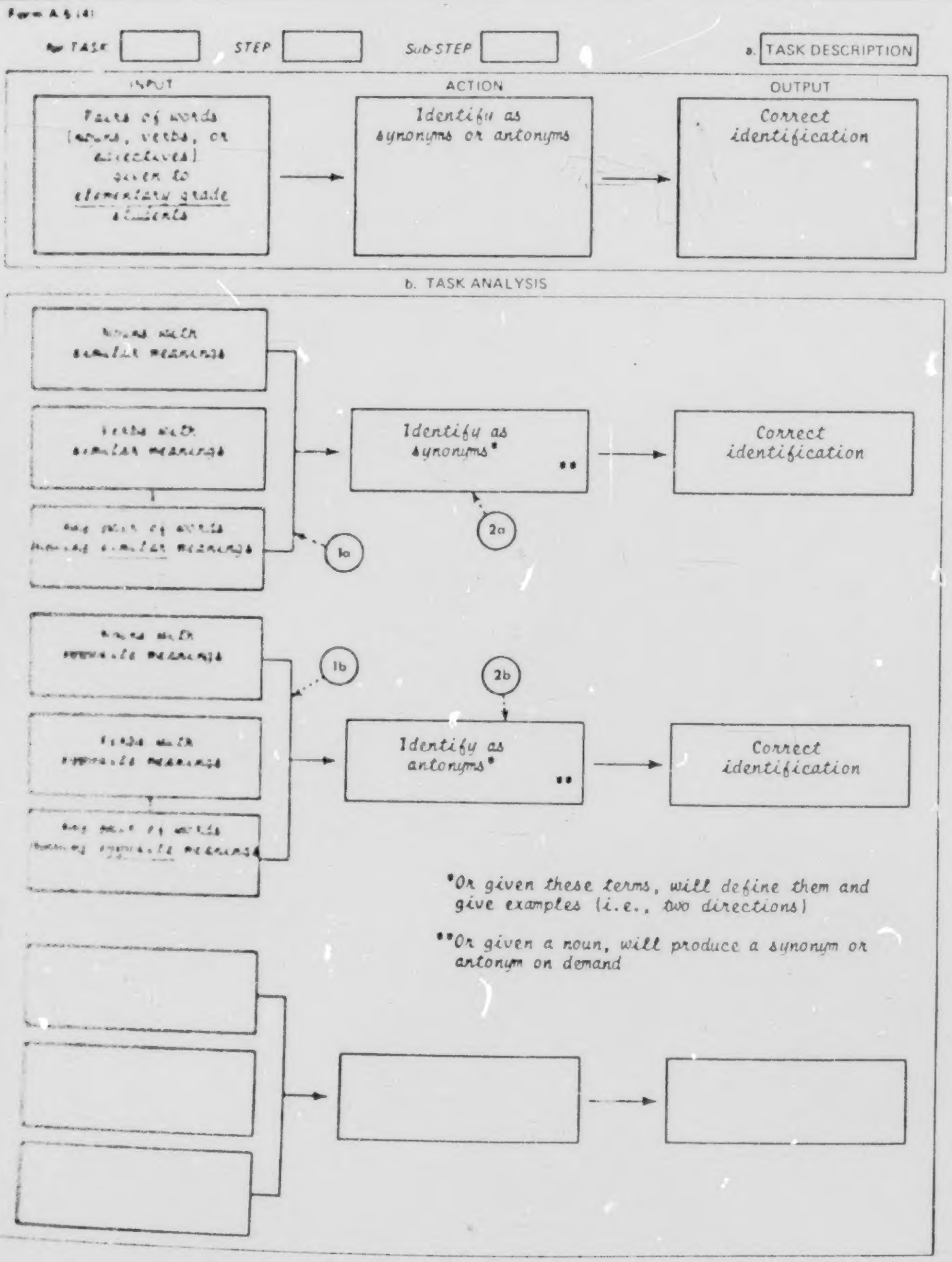
THESE RESULTS REFLECT ANALYSES OF WHAT IS INVOLVED IN TEACHING (PRIMARY GRADE) STUDENTS TO BE ABLE TO IDENTIFY, DEFINE, AND ILLUSTRATE: "SYNONYMS" AND "ANTONYMS."

NOTE: Section "b" of FORM A.5(4) identifies:

1 --the classes of word types (1a) and (1b) which have to be discriminated one from the other.

--the variety of word types within class (1a) and within class (1b) which have to be generalized (seen as being similar).

2 the ACTION (response) (2a) or (2b) to be associated with each class of word type.


Form A.5(4)
TASK
STEP
Sub-STEP
a. TASK DESCRIPTION
INPUT
ACTION
OUTPUT
Pairs of words (nouns, verbs, or adjectives) given to elementary grade students
Identify as synonyms or antonyms
Correct identification
b. TASK ANALYSIS
Nouns with similar meanings
Verbs with similar meanings
Any pair of words having similar meanings
1a
Identify as synonyms* **
2a
Correct identification
Nouns with opposite meanings
Verbs with opposite meanings
Any pair of words having opposite meanings
1b
2b
Identify as antonyms* **
Correct identification

*Or given these terms, will define them and give examples (i.e., two directions)

**Or given a noun, will produce a synonym or antonym on demand

NOTE: (i) The endorsement of the TRANSFER boxes in the column marked "competency analysis" signifies that on a test the learner will be required to respond to new examples (those not encountered during instruction).

② There is an endorsement of "hi" anticipated generalization difficulty in section "c" of the FORM — due to the large number of new words in the language the learner may be faced with.

COMPETENCY ANALYSIS

c. LEARNING ANALYSIS

level of difficulty in acquiring

d. MODE ANALYSIS

INPUT

①
recall ☐
transfer ☒

DISCRIMINATIONS

due to	hi	med	lo
similarity			X
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity			X
No. of properties			X
② No. of inputs	X		

		symbolic	verbal	environmental
VISUAL	realistic		X	
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER Kinaesthetic, smell, taste

ACTION/ CHAIN

recall ☐
transfer ☒

ASSOCIATIONS

due to	hi	med	lo
No. of associations			X
associative strength of other actions			

GENERALIZATIONS

	hi	med	lo
integrative strength of action		X	

CHAINS

	hi	med	lo
length of chain			
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub/vocal
recognition				
editing				
production		X		X

OUTPUT

recall ☐
transfer ☐

DISCRIMINATIONS

due to	hi	med	lo
similarity			
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity			
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic		X	
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER Kinaesthetic, smell, taste

NOTE: --There are three criterion objectives (one on each row) for the program which has already been prepared and which you will revise.

--Each statement identifies (in each column):

- ••what will be presented to the student (GIVEN)
- ••what he will do (STUDENT WILL)
- ••the output and its standards (RESULTING IN)

Form D.2(1)

LESSON ☐

SPECIFICATION OF OBJECTIVES

	GIVEN	STUDENT WILL	RESULTING IN
	Criterion Inputs ● mode: visual/verbal/etc ● number of examples from class ● new and/or old examples ● typical/atypical conditions ● availability of performance aids	Criterion Actions ● mode: recognition, editing, production ● alternatives: new and/or old examples ● mode: perceptual/motor/vocal/sub vocal	Criterion Outputs ● mode: visual/verbal/etc. ● limits, standards ● quantitative: amount /degree/time limits ● qualitative
1.	CRITERION -Pairs of words (nouns, verbs, or adjectives) -Both new and old examples of synonyms or antonyms	Identify them as synonyms or antonyms	Correct identification 100%
2.	CRITERION -Terms "synonym" and "antonym"	Will define the terms in his own words and give two (new) examples of each	Correct definition and examples 100%
3.	CRITERION -Single words (high frequency words) -Request for either a synonym or antonym	Produce a synonym or an antonym	Correct synonym or antonym 100%

NOTE: --The objectives on the opposite page are used by the developer. The "objectives" on this page are given to the student when he goes through the program which is developed.

--The first two columns (GIVEN and YOU WILL) reproduce the information used by the developer.

--The third column identifies for the student what he has to learn in order to be able to perform what is identified in the first two columns.

Form D.2(2)

STATEMENT OF OBJECTIVES
FOR STUDENTS

LESSON ☐

	GIVEN	YOU WILL	YOU MUST LEARN TO
	Inputs ● objects, people, events, words, symbols, etc. ● their properties ● examples: number, new or old ● availability of performance aids ● typical/atypical conditions ● problem format e.g., single input vs. multiple choice	Actions ● select, edit, or produce ● type of action e.g., point to, label, write, classify, etc. RESULTING IN Outputs ● objects, events, words, symbols, etc. ● their properties (quantity/quality) ● standards of acceptability	● distinguish between examples from ____ # ____ input classes ● on the basis of ____ # ____ properties ● see similarity among examples within each of the ____ # ____ input classes ● on the basis of ____ # ____ properties ● associate one of ____ # ____ actions with each one of the ____ # ____ input classes ● exhibit ____ # ____ alternative actions ● exhibit the series of associations in the ____ chain
1.	-Given pairs of nouns which are either synonyms or antonyms and with the aid of a special dictionary to look up words you may not know	You will identify the pairs as being synonyms or antonyms	-You must learn to tell the difference between two types of relationships between words -These relationships are based on similarity or dissimilarity of meaning
2.	-Given the terms "synonym" and "antonym"	You will be expected to define them in your own words and to provide two (correct) examples of each (your own)	-You will also have to remember which type of relationship is called a synonym and which is called an antonym
3.	-Given a noun	-You will be expected to produce either a synonym for it or an antonym -You will be expected to get all test items correct	

NOTE: --The decision whether or not to have students practice with a simulated version of the criterion behavior is based on two sets of criteria, one instructional and the other logistical.

-- ① The "N" entries in the top portion of the FORM signify that on all criteria there is a NEGLIGIBLE need for simulation.

--Accordingly, there are no simulation plans entered in the bottom section of the FORM.

Form E 1(1)

LESSON ☐ OBJECTIVE ☐ SIMULATION DECISIONS

a. assessing simulation needs due to

①

LOGISTICAL CONSIDERATIONS			INSTRUCTIONAL CONSIDERATIONS		
downtime	cost	danger	sampling	standardization	manipulation
N	*N*	*N*	*N*	*N*	*N*

b. planning simulation when needed *No simulation needed - all paper and pencil*

INPUT types	PROPERTIES: physical, psychological	SIMULATION PLANS: visual, audio, etc.
people		
man made objects		
natural objects		
events		
words		
symbols		
other		

ACTION types		
perceptual		
motor		
vocal		
sub-vocal		

OUTPUT types		
people		
man made objects		
natural objects		
events		
words		
symbols		
other		

NOTE: --The TEST to be given to students is outlined on this FORM.

--Three types of test items 1a , 1b , & 1c are identified and a total of twenty items listed in row No. 1.

--The remaining two rows indicate what the student is expected to do.

Form F 2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT		
	1a	1b	1c
– Instructions – Question or Problem • • INPUTS (new/old) • • AIDS (when applicable) • • ANSWER OPTIONS (when applicable)	*For each pair, check whether it is a synonym, an antonym, or neither:* *(1) modern/ancient* *(2) radio/television* *(3) repaired/fixed* *(4) difference/likeness* *(5) written/spoken* *(6) less/fewer than*	*In your own words define the terms:* *(7) "synonym" and* *(8) "antonym"* *Give two examples of each (of your own):* *(9), (10) synonyms and* *(11), (12) antonyms*	*Give me a synonym and an antonym for the following words:* *(13) quick* *(14) often* *(15) departed* *(16) begin* *(17) riches* *(18) warmth* *(19) build* *(20) handsome*

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO		
– ACTIONS (new/old) • • mode	*2a. Checks "synonym," "antonym," or "neither" for each pair*	*2b. Produces a definition and two examples for each term*	*2c. Produces a synonym and an antonym*

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT		
– OUTPUT • • answers • • product – Type of Scoring – Standards for Scoring	*3a. 100% correct*	*3b. Idea of "similar meaning" and "opposite meaning" present in definition; two examples for each term*	*3c. Similar and opposite meanings acceptable without attention to fine shadings in meaning*

NOTE: --Pages 1.10 and 1.11 contain the FORM used in planning an instructional strategy for the performance described and analyzed on the preceding pages.

--Row IA on this page: The circled endorsements summarize the analyses entered on pages 1.4 and 1.5.

--Row IIA: The endorsements in row IA serve as a basis for entering the matrix on row IIA and thereby identifying potential strategies.

--Row III: This now provides a reminder of other procedures which need to be performed.

Form G.1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE	LEARNING PROBLEMS	PROBLEM SOURCE	MODE
☐ simulation ☐ aids available ☑ two directions ☑ 1 transfer ☐ 2 delayed basis ☐ recognition mode	INPUTS ☑ 3 discriminations ☑ 4 generalizations INPUTS & ACTIONS ☐ 5 associations ☐ 6 chains ACTIONS ☐ 7 generalizations ☐ partial proficiency	INPUTS ☑ A similarity (dis.) ☐ B No. of properties ☐ C No. of classes (or, No. members/class) INPUTS & ACTIONS ☐ D existing associations ☐ E length of chain ACTIONS ☐ F integrative strength	INPUTS / OUTPUTS ☑ i verbal/symbolic ☑ i ☐ ii environmental ☐ ii ☐ iii audio ☐ iii ☐ iv non-realistic ☐ iv ☐ v transient ☐ v ACTIONS ☐ vi perceptual ☐ viii vocal ☑ vii motor ☐ ix sub-vocal

IIA. Select Preparatory Practice Progression(s)

UNIT SIZE	MODE	PROMPTING/FADING	CONTENT	FREQUENCY or VARIATION
a shaping gradual increases in: quantity quality	b R/E/P c visual/verbal d concrete/abstract e procedures/principles	f examples or demonstrations g verbal cues h visual cues i diagramming, overviews	j principles/procedures k altered criterion/criterion l errors/criterion m editing/criterion n backward chaining	o repetition p review q varied examples

▨		2	A	B	C	D	E	F	i	vi	vii
1	q	o·p	g	g				g·i	e	h	i
3	b·q	i·o·p	g·h·k	i·g	i					h	
4	b·q	i·o·p	g·h	i·g	i·g				g	h	i
3+4	[✓ b·i·q]	i·o·p	[✓ g·h]	i·g	i·g				[✓ c·d·e]		
5	b·o	i·o·p			i·g·o·p	b·g·l					
6	a·f·m·n	o·p					a·n				a·m·n
7	i	o·p						g·h·j			i

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION	PROVIDE FEEDBACK	REINFORCE PRACTICE	PROVIDE DELAYED REINFORCEMENT
Advance Organizers statement of objectives instructions *Cues* visual or verbal formats, diagrams checklists	*Correctness of Answers (Solutions)* standard available for comparison discrimination practice re: correct outputs	*Intrinsic Reinforcers* interesting materials *Extrinsic Reinforcers* social monetary activities grades	*Extrinsic Reinforcers* social monetary activities

NOTE: --Row IB describes the three types of criterion behavior it is planned to have students practice at the tail end of the instructional program.

--Row IIB describes the types of prior practice it is planned to use in preparing students to be able to engage in practice of the criterion behavior.

--Row IV describes the selection of media required to permit the above types of practice.

PLAN INSTRUCTIONAL STRATEGIES

IB. Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
	(1) Terms "synonym" and "antonym"	Define them and give two examples	Illustrated definition
EXAMPLE(S) properties of additional examples	(2) Single nouns, verbs, or adjectives and told to give a synonym or antonym	Will produce them	Correct synonym or antonym
	(3) Pairs of words	Will indicate whether they are synonyms, antonyms, or neither	Correct identification

IIB. Design Preparatory Practice Progression

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT
Recognition 1st	Pairs of words; verbal cues to assist; easy examples, e.g., big/large	Indicate whether they mean the same thing, or something different, or something opposite	Correct identification of relationship among meanings of word pairs
Recognition 2nd	Pairs identified as having the same or opposite meanings	Identify as synonyms or antonyms	Correct identification
Editing and production 3rd	Single words	Produce a synonym or antonym	Correct synonym or antonym

IIC. Characterize

MODE

INPUTS		OUTPUTS
[✓ i]	verbal/symbolic	[✓ i]
☐ ii	environmental	☐ ii
☐ iii	audio	☐ iii
☐ iv	non-realistic	☐ iv
☐ v	transient	☐ v
	ACTIONS	
☐ vi	perceptual	
[✓ vii]	motor writing	
☐ viii	vocal	
☐ ix	subvocal	

IV. Select Media

INPUT/OUTPUT DISPLAY

r.	print	s.	environmental	t.	devices
r.1	verbal	s.1	people (behavior)	t.1	film, TV
r.2	pictorial	s.2	objects	t.2	slides, projectors
		s.3	events	t.3	simulator
				t.4	audio-tape

	i verbal/symbolic		ii environmental		
INPUTS ► ▼	iii audio	visual	iii audio	visual: v transient	visual: non-v
realistic	s.1		s.2 s.3	s.3	s.1 s.2
iv non-realistic	t.4	[✓ r.1] r.2 t.1 t.2 t.3	t.4	t.1 t.3	t.2 t.3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u.	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS ►	i verbal/symbolic		ii environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non-v
vi & ix	t.4	u		u		
vii		[✓ u]	t.4	u	t.1	s.2 t.3
viii	t.4					

INSTRUCTIONS

The program you are to revise appears on page 1.14 in this section.

Your revision should be based on the data summarizing errors made by students on the program (on page 1.15) and on data summarizing errors made on the test given to students after they completed taking the program (on page 1.17).

CONTENTS IN THIS SECTION

FORM NO.	TITLE	PAGE
FORM I.2(1)	Developing instructional materials	1.14
FORM J.2(1)	Summary of errors on program	1.15
	The CRITERION TEST	1.16
FORM J.2(2)	Errors on the CRITERION TEST	1.17

YOUR ASSIGNMENT

(1) Review the error data provided in this section and then revise the program which appears on page 1.14. Your revisions may consist of:

--changing existing problems

--adding or subtracting problems

--combining problems

(2) Try out your revised program with at least one student (preferably five students).

(3) YOUR PRODUCT WILL BE A REVISED PROGRAM.

NOTE: --This program was developed on the basis of the analyses which have appeared on the preceding pages.

--Based on the new data appearing on page 1.15, you will revise this program.

--Note that there are nine (I-IX) frames calling for a total of twenty-three separate responses.

Form I.2(1)

DEVELOPING INSTRUCTIONAL MATERIALS

LESSON ☐ *(SUB-) CRITERION BEHAVIOR* ☐

	MAXIMUM ASSISTANCE	INTERMEDIATE ASSISTANCE	NO ASSISTANCE
RECOGNIZE	I Next to each pair of words, indicate with an X whether the words have similar meanings, opposite meanings, or neither: S O N 1. small/big ___ ___ ___ 2. big/large ___ ___ ___ 3. small/pretty ___ ___ ___	II Words having similar meanings are called "snyonyms." Words having opposite meanings are called "antonyms." Next to each of the following pairs of words, write in either "synonym," "antonym," or "neither." 4. small/big ______ 5. big/large ______ 6. small/large ______	III Match up these definitions: A. Words with similar meanings B. Words with opposite meanings 7. ___ synonyms 8. ___ antonyms
EDIT	IV Someone incorrectly called this pair of adjectives antonyms: quick/fast What should they have called them? 9. ______________	V This is an incorrect definition for the word "synonyms." Change the definition. 10. "Synonyms are words having opposite meanings."	VI Is this a correct definition for the word "antonyms"? If not, change it and make it correct. 11. "Antonyms are words having the same meanings."
PRODUCE	VII Indicate whether each of these pairs is a synonym, antonym, or neither. S A N 12. tall/short ___ ___ ___ 13. truth/lie ___ ___ ___ 14. boat/house ___ ___ ___ 15. auto/car ___ ___ ___ 16. gold/silver ___ ___ ___	VIII Write a synonym and an antonym for each of the following words: 17. happiness 18. practical 19. intelligent 20. return 21. tired Also write another word for each which is neither a synonym nor an antonym.	IX Define the terms "synonym" and "antonym" and give two of your own examples for each. 22. ______________ ______________ ______________ 23. ______________ ______________ ______________

NOTE: --This page summarizes the errors made by students on each of the twenty-three problems in the program on page 1.14 (opposite).

--The hash marks appear in the row which indicates what the nature of the error is; e.g., for item #3, six students incorrectly called "small/pretty" synonymous.

-. *Each response in the program is treated as a practice item. Therefore, there are results for 23 items (rather than just 9). Twenty people took the program.*

Form J 2(1)

LESSON ☐ (SUB-) CRITERION BEHAVIOR ☐ SUMMARY OF ERRORS ON ~~CRITERION TEST~~ PROGRAM

ITEM #'S Options Endorsed	1	2 I	3	4	5 II	6	7	8 III	9 IV	10 V	11 VI	12	13	14 VII	15	16	17	18	19 VIII	20	21	22	23 IX	24	25
a *synonym			卌 /			卌 /	///							/			////		///			卌			
b *antonym					卌 /			//						//			////			卌			卌 ///		
c. *neither				卌 /													////		//						
									卌					/											
e. *where applicable										卌 ///															
Total Number of People Making Errors																									
% of Group Making Errors N = 20																									
Performance Requirements	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
INPUT recall																									
INPUT transfer																									
ACTION recall																									
ACTION transfer																									

This is the Criterion TEST taken from the test development FORM F.2(1) (which appears on page 1.7)

For each pair of words, indicate with a check whether it is a synonym (S), antonym (A), or neither (N).

	S	A	N
1. modern/ancient	___	___	___
2. radio/television	___	___	___
3. repaired/fixed	___	___	___
4. difference/libreners	___	___	___
5. written/spoken	___	___	___
6. less/fewer than	___	___	___

In your own words, define the following terms:

7. synonym: ______________________________

____

8. antonym: ______________________________

____

Create your own examples of two synonyms:

9. ______________ / ______________

10. ______________ / ______________

Create your own examples of two antonyms:

11. ______________ / ______________

12. ______________ / ______________

In the spaces preceded, write in a synonym and an antonym for the following words:

	synonym	antonym
13. quick	___________	___________
14. often	___________	___________
15. departed	___________	___________
16. begin	___________	___________
17. riches	___________	___________
18. warmth	___________	___________
19. build	___________	___________
20. handsome	___________	___________

NOTE: --Errors on the test (opposite) are summarized in this FORM.

--Complete the FORM by tabulating across rows and down columns.

--Use these data (along with program errors on page 1.15) as a basis for revising the program.

Form J.2(2)

LESSON ☐ (SUB-) CRITERION BEHAVIOR ☐

TEST ERRORS*

	ITEM NUMBERS																											RECALL	TRANSFER	TOTAL	%
STUDENTS ⇩	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	No. of Items	No. of Items	No. of Items	Total Errors / Total No. of Items
a.				/			/	/	/	/	/	/				/	/		/												
b.															/					/											
c.			/															/													
d.																															
e.									/					/	/																
f.	/	/		/	/		/	/					/	/	/		/	/	/	/											
g.																															
h.																/	/	/													
i.							/	/																							
j.				/																											
k.							/	/		/							/														
ℓ.																				/											
m.								/	/																						
n.			/		/	/		/		/					/	/	/	/													
o.							/	/																							
p.																															
q.							/			/																					
ℓ.								/		/																					
m.										/						/		/		/											
n.							/	/																							
Percentage of Students																														n =	

N = 20 students

*all test items are TRANSFER items

In making your revisions of the program on page 1.14 either use blank paper or a blank FORM 1.2(1).*

**Blank forms are available either in the HANDBOOK sub-volume "I" or "X."*

DO NOT TURN PAGE
UNTIL YOU HAVE COMPLETED
YOUR REVISION OF THE PROGRAM

After you have completed your revision of the program, refer to the suggested revision which appears on page 1.21 for comparison purposes. Your revision is, of course, not very likely to look like the one printed here. However, if you can provide a rationale for your own revision, and, more important, if you try out your revised program and it works, matching the suggested revision exactly becomes irrelevant.

Try out your revised program with at least one student.

ANSWER:

SUGGESTED REVISIONS

Before Cell #I: Add these two items

1a. Think about the meaning of these two words:

large - small

These two words:

__Mean the same thing

__Have opposite meanings

1b. The words "boy" and "dog" don't mean the same thing. They also don't have opposite meanings.

How about these two words:

cheerful - poor

Do they:

__Mean the same thing

__Have opposite meanings

__Neither

Following Cell #VI: Add these two items

6a. Here is an example of antonyms:

good - bad

Make up your own example of an antonym.

____

Now, in your own words, define "antonyms."

____

6b. Here is an example of synonyms:

sad - unhappy

Make up your own example of a synonym.

____

Now, in your own words, define "synonyms."

____

Following Cell #VII: Add this item

7a. Your task is to make up a word to fill the blanks:

	Synonym	Antonym	Neither
cheerful -		unhappy	building
brave -	courageous		distant
fear -	fright	courage	

FINAL EXERCISE #2

DEVELOPING AN INSTRUCTIONAL PROGRAM

NOT TO BE PERFORMED UNTIL
ALL WORKBOOK EXERCISES
ASSOCIATED WITH HANDBOOK
SECTION "I" HAVE BEEN
COMPLETED.

FINAL EXERCISE #2:
Developing an Instructional Program

Before doing this exercise, you should have completed the following tasks:

(1) Read HANDBOOK Section "I": DEVELOP INSTRUCTIONAL MATERIALS

and

(2) Do the WORKBOOK exercises associated with Section "I."

Your assignment in this exercise is to perform TASK I; "developing an instructional program." As a basis for performing this task, starting on the next page you will be given completed results for prior tasks in the materials development process.

Following your review of these results, you are to develop your own program using materials provided in the section beginning on page 2.13.

Before doing the "materials development" assignment, review the completed FORMS which contain the results of PRIOR DEVELOPMENT TASKS.

RESULTS OF PRIOR DEVELOPMENT TASKS
WHICH ARE MADE AVAILABLE TO YOU

TASK LABEL	TASK TITLE	FORM NO.
B	Task analysis, learning analysis, competency analysis, and mode analysis	A.5(4)
D	Statement of objectives	D.2(1) and D.2(2)
E	Simulation plans	E.1(1)
F	Test development	F.2(1)
G	Instructional strategies	G.1(2)

Review the results of these prior TASKS which begin on the next page. They are the same ones as used in FINAL EXERCISE #1.

NOTE: Section "b" of FORM A.5(4) identifies:

1 --the classes of word types (1a) and (1b) which have to be discriminated one from the other.

--the variety of word types within class 1a and within class 1b which have to be generalized (seen as being similar).

2 the ACTION (response) (2a) or (2b) to be associated with each class of word type.

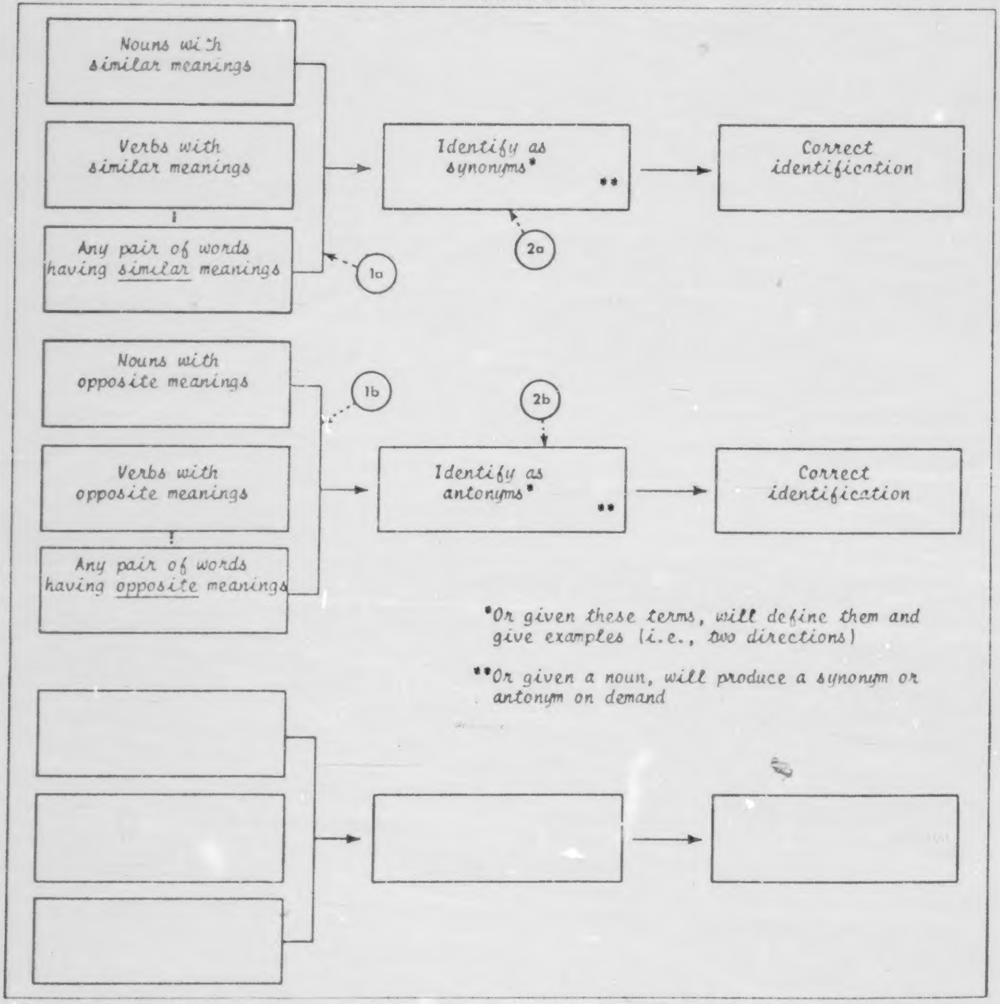
Form A-5 (4)

for TASK ☐ STEP ☐ Sub-STEP ☐

a. TASK DESCRIPTION

INPUT	ACTION	OUTPUT
Pairs of words (nouns, verbs, or adjectives) given to elementary grade students	Identify as synonyms or antonyms	Correct identification

b. TASK ANALYSIS


Nouns with similar meanings
Verbs with similar meanings
Any pair of words having similar meanings
1a
Identify as synonyms* **
2a
Correct identification
Nouns with opposite meanings
Verbs with opposite meanings
Any pair of words having opposite meanings
1b
2b
Identify as antonyms* **
Correct identification

*Or given these terms, will define them and give examples (i.e., two directions)

**Or given a noun, will produce a synonym or antonym on demand

NOTE: ① The endorsement of the TRANSFER boxes in the column marked "competency analysis" signifies that on a test the learner will be required to respond to new examples (those not encountered during instructions).

② There is an endorsement of "hi" anticipated generalization difficulty in section "c" of the FORM — due to the large number of new words in the language the learner may be faced with.

COMPETENCY ANALYSIS ▽	c. LEARNING ANALYSIS level of difficulty in acquiring	d. MODE ANALYSIS

INPUT

①
recall ☐
transfer ☒

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			X
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity			X
No. of properties			X
② No. of inputs	X		

		symbolic	verbal	environmental
VISUAL	realistic		X	
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

ACTION/ CHAIN

recall ☐
transfer ☒

ASSOCIATIONS

due to ▽	hi	med	lo
No. of associations			X
associative strength of other actions			

GENERALIZATIONS

	hi	med	lo
integrative strength of action		X	

CHAINS

	hi	med	lo
length of chain			
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub/vocal
recognition				
editing				
production			X	

OUTPUT

recall ☐
transfer ☐

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity			
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic		X	
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

NOTE: --There are three criterion objectives (one on each row) for the program which has already been prepared and which you will revise.

--Each statement identifies (in each column):

- ••what will be presented to the student (GIVEN)
- ••what he will do (STUDENT WILL)
- ••the output and its standards (RESULTING IN)

Form D 2(1)

LESSON ☐

SPECIFICATION OF OBJECTIVES

	GIVEN	STUDENT WILL	RESULTING IN
	Criterion Inputs ● mode visual/verbal/etc ● number of examples from class ● new and/or old examples ● typical/atypical conditions ● availability of performance aids	Criterion Actions ● mode recognition, editing, production ● alternatives new and/or old examples ● mode perceptual/motor/vocal/sub-vocal	Criterion Outputs ● mode visual/verbal/etc ● limits, standards ● quantitative amount /degree/time limits ● qualitative
1.	CRITERION -Pairs of words (nouns, verbs, or adjectives) -Both new and old examples of synonyms or antonyms	Identify them as synonyms or antonyms	Correct identification 100%
2.	CRITERION -Terms "synonym" and "antonym"	Will define the terms in his own words and give two (new) examples of each	Correct definition and examples 100%
3.	CRITERION -Single words (high frequency words) -Request for either a synonym or antonym	Produce a synonym or an antonym	Correct synonym or antonym 100%

NOTE: --The objectives on the opposite page are used by the developer. The "objectives" on this page are given to the student when he goes through the program which is developed.

--The first two columns (GIVEN and YOU WILL) reproduce the information used by the developer.

--The third column identifies for the student what he has to learn in order to be able to perform what is identified in the first two columns.

Form D.2(2)

LESSON ☐

STATEMENT OF OBJECTIVES
FOR STUDENTS

	GIVEN	YOU WILL	YOU MUST LEARN TO
	Inputs • objects, people, events, words, symbols, etc • their properties • examples: number, new or old • availability of performance aids • typical/atypical conditions • problem format e.g., single input vs. multiple choice	Actions • select, edit, or produce • type of action e.g., point to, label, write, classify, etc RESULTING IN Outputs • objects, events, words, symbols, etc • their properties (quantity/quality) • standards of acceptability	• distinguish between examples from ___ # ___ input classes • on the basis of ___ # ___ properties • see similarity among examples within each of the ___ # ___ input classes • on the basis of ___ # ___ properties • associate one of ___ # ___ actions with each one of the ___ # ___ input classes • exhibit ___ # ___ alternative actions • exhibit the series of associations in the ___ chain
1.	*-Given pairs of nouns which are either synonyms or antonyms and with the aid of a special dictionary to look up words you may not know*	*You will identify the pairs as being synonyms or antonyms*	*-You must learn to tell the difference between two types of relationships between words* *-These relationships are based on similarity or dissimilarity of meaning*
2.	*-Given the terms "synonym" and "antonym"*	*You will be expected to define them in your own words and to provide two (correct) examples of each (your own)*	*-You will also have to remember which type of relationship is called a synonym and which is called an antonym*
3.	*-Given a noun*	*-You will be expected to produce either a synonym for it or an antonym* *-You will be expected to get all test items correct*	

NOTE: --The decision whether or not to have students practice with a simulated version of the criterion behavior is based on two sets of criteria, one instructional and the other logistical.

-- ① The "N" entries in the top portion of the FORM signify that on all criteria there is a NEGLIGIBLE need for simulation.

--Accordingly, there are no simulation plans entered in the bottom section of the FORM.

Form E.1(1)

LESSON ☐ OBJECTIVE ☐ SIMULATION DECISIONS

a. assessing simulation needs due to

	LOGISTICAL CONSIDERATIONS			INSTRUCTIONAL CONSIDERATIONS		
①	downtime	cost	danger	sampling	standardization	manipulation
	N	N	N	N	N	N

b. planning simulation when needed *No simulation needed - all paper and pencil*

INPUT types	PROPERTIES: physical, psychological	SIMULATION PLANS: visual, audio, etc.
people		
man made objects		
natural objects		
events		
words		
symbols		
other		
ACTION types		
perceptual		
motor		
vocal		
sub-vocal		
OUTPUT types		
people		
man made objects		
natural objects		
events		
words		
symbols		
other		

NOTE: --The TEST to be given to students is outlined on this FORM.

--Three types of test items 1a , 1b , & 1c are identified and a total of twenty items listed in row No. 1.

--The remaining two rows indicate what the student is expected to do.

Form F 2(1)

LESSON ☐ OBJECTIVE ☐ FORM FOR TEST DEVELOPMENT

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT		
	1a	1b	1c
— Instructions — Question or Problem ••INPUTS (new/old) ••AIDS (when applicable)	*For each pair, check whether it is a synonym, an antonym, or neither:* *(1) modern/ancient* *(2) radio/television* *(3) repaired/fixed* *(4) difference/likeness* *(5) written/spoken* *(6) less/fewer than*	*In your own words define the terms:* *(7) "synonym" and* *(8) "antonym"* *Give two examples of each (of your own):* *(9), (10) synonyms and* *(11), (12) antonyms*	*Give me a synonym and an antonym for the following words:* *(13) quick* *(14) often* *(15) departed* *(16) begin* *(17) riches* *(18) warmth* *(19) build* *(20) handsome*
••ANSWER OPTIONS (when applicable)			

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO		
— ACTIONS (new/old) ••mode	*2a. Checks "synonym," "antonym," or "neither" for each pair*	*2b. Produces a definition and two examples for each term*	*2c. Produces a synonym and an antonym*

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT		
— OUTPUT ••answers ••product — Type of Scoring — Standards for Scoring	*3a. 100% correct*	*3b. Idea of "similar meaning" and "opposite meaning" present in definition; two examples for each term*	*3c. Similar and opposite meanings acceptable without attention to fine shadings in meaning*

NOTE: --Pages 1.10 and 1.11 contain the FORM used in planning an instructional strategy for the performance described and analyzed on the preceding pages.

--Row IA on this page: The circled endorsements summarize the analyses entered on pages 1.4 and 1.5.

--Row IIA: The endorsements in row IA serve as a basis for entering the matrix on row IIA and thereby identifying potential strategies.

--Row III: This now provides a reminder of other procedures which need to be performed.

Form G 1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA Characterize Criterion Practice Requirements

PERFORMANCE	LEARNING PROBLEMS	PROBLEM SOURCE	MODE
☐ simulation ☐ aids available [✓ ☐] two directions [✓ 1] transfer 2 delayed basis ☐ recognition mode	INPUTS [✓ 3] discriminations [✓ 4] generalizations INPUTS & ACTIONS 5 associations 6 chains ACTIONS 7 generalizations ☐ partial proficiency	INPUTS [✓ A] similarity (dis.) B No. of properties C No. of classes (or No. members/class) INPUTS & ACTIONS D existing associations E length of chain ACTIONS F integrative strength	INPUTS OUTPUTS [✓ i] verbal/symbolic [✓ i] ii environmental ii iii audio iii iv non realistic iv v transient v ACTIONS vi perceptual viii vocal [✓ vii] motor ix sub-vocal

IIA Select Preparatory Practice Progression(s)

UNIT SIZE	MODE	PROMPTING/FADING	CONTENT	FREQUENCY or VARIATION
a shaping gradual increases in quantity quality	b R/E/P c visual/verbal d concrete/abstract e procedures/principles	f examples or demonstrations g verbal cues h visual cues i diagramming overviews	j principles/procedures k altered criterion/criterion l errors/criterion m editing/criterion n backward chaining	o repetition p review q varied examples

		2	A	B	C	D	E	F	i	vi	vii
1	q	o p	g	g				g i	e	h	i
3	b q	i o p	g h k	i g	i					h	
4	b q	i o p	g h	i g	i g				g	h	i
3+4	[✓ b i q]	i o p	[✓ g h]	i g	i g				[✓ c d e i]		
5	b o	i o p			i g o p	b q l					
6	a f m n	o p					a n				a m n
7	i	o p						g h i			i

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION	PROVIDE FEEDBACK	REINFORCE PRACTICE	PROVIDE DELAYED REINFORCEMENT
Advance Organizers statement of objectives instructions *Cues* visual or verbal formats, diagrams checklists	*Correctness of Answers (Solutions)* standard available for comparison discrimination practice re. correct outputs	*Intrinsic Reinforcers* interesting materials *Extrinsic Reinforcers* social monetary activities grades	*Extrinsic Reinforcers* social monetary activities

NOTE: --Row IB describes the three types of criterion behavior it is planned to have students practice at the tail end of the instructional program.

--Row IIB describes the types of prior practice it is planned to use in preparing students to be able to engage in practice of the criterion behavior.

--Row IV describes the selection of media required to permit the above types of practice.

PLAN INSTRUCTIONAL STRATEGIES

IB Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
EXAMPLE(S) properties of additional examples	(1) Terms "synonym" and "antonym"	Define them and give two examples	Illustrated definition
	(2) Single nouns, verbs, or adjectives and told to give a synonym or antonym	Will produce them	Correct synonym or antonym
	(3) Pairs of words	Will indicate whether they are synonyms, antonyms, or neither	Correct identification

IIB Design Preparatory Practice Progression

IIC Characterize

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT	MODE
Recognition 1st	Pairs of words; verbal cues to assist; easy examples, e.g., big/large	Indicate whether they mean the same thing, or something different, or something opposite	Correct identification of relationship among meanings of word pairs	INPUTS OUTPUTS [✓ i] verbal/symbolic [✓ i] ☐ ii environmental ☐ ii ☐ iii audio ☐ iii ☐ iv non realistic ☐ iv ☐ v transient ☐ v ACTIONS ☐ vi perceptual [✓ vii] motor writing ☐ viii vocal ☐ ix subvocal
Recognition 2nd	Pairs identified as having the same or opposite meanings	Identify as synonyms or antonyms	Correct identification	
Editing and production 3rd	Single words	Produce a synonym or antonym	Correct synonym or antonym	

IV Select Media

INPUT/OUTPUT DISPLAY

r	print	s	environmental	t	devices
r 1	verbal	s 1	people (behavior)	t 1	film, TV
r 2	pictorial	s 2	objects	t 2	slides, projectors
		s 3	events	t 3	simulator
				t 4	audio tape

	i verbal/symbolic		ii environmental		
INPUTS ► ▼	iii audio	visual	iii audio	visual v transient	visual non v
realistic	s 1		s 2 s 3	s 3	s 1 s 2
iv non realistic	t 4	[✓ r 1] r 2 t 1 t 2 t 3	t 4	t 1 t 3	t 2 t 3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t 3	simulator	u	paper and pencil
s 2	objects, equipment (manipulanda)	t 1	film, TV
		t 4	audio tape

OUTPUTS►	i verbal/symbolic		ii environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non v
vi & ix	t 4	u		u		
vii		[✓ u]	t 4	u	t 1	s 2 t 3
viii	t 4					

YOUR ASSIGNMENT

Based on the materials you have just reviewed, develop your own program:

(1) Use the FORM which appears on page 2.15 in your program. Create practice problems to go with the diagram. The diagram should be designed to provide the necessary cuing to your students.

(2) When completed, administer the program and the criterion test to at least one student (preferably five students).

(3) Sit with the student as he goes through the program. When he makes errors, probe for their sources.

(4) Revise the program in the light of tryout results.

YOUR PRODUCTS WILL INCLUDE:

- --an instructional program
- --protocols of student responses to probes
- --program and test results
- --a revised program

CONTENTS IN THIS SECTION

FORM NO.	TITLE	PAGE
	Diagram for use in program	2.15

CONCEPTS	SYNONYM		ANTONYM	NEITHER
Examples Definition		vs		vs
DEFINING PROPERTIES				
OSSIBLE ARIATIONS				
USE IN A SENTENCE				

DO NOT TURN PAGE
UNTIL YOU HAVE DEVELOPED
YOUR OWN PROGRAM

AFTER you have completed developing your own program, and AFTER you have tried it out with at least one student, refer to the next several pages for a sample program using a diagram.

CONCEPTS	SYNONYM		ANTONYM		NEITHER
Examples	handsome - good looking distant - far defend - protect big - large	VS	hardsome/ugly distant/close defend/attack big/small	VS	handsome -- late distant -- crowded defend -- leave big -- cheap
Definition					
DEFINING PROPERTIES	-A word that has the same meaning as another word -Two words that have the same or similar meaning are called "synonyms" (plural)		-A word that has the opposite meaning to another word -Two words that have opposite meanings are called "antonyms" (plural)		-A word that is neither a synonym nor an antonym for another word
POSSIBLE VARIATIONS	-Various parts of speech can have synonyms for each other: ••Two nouns: honesty - truthfulness ••Two verbs: to enter - to go in ••Two adjectives: near - close ••Two adverbs: rapidly - quickly		-Various parts of speech can have antonyms for each other: ••Two nouns: honesty/dishonesty ••Two verbs: to enter/to leave ••Two adjectives: distant/close ••Two adverbs: rapidly/slowly		••Two nouns: honesty -- timeliness ••Two verbs: to enter -- to pay ••Two adjectives: distant -- rich ••Two adverbs: rapidly -- closely
USE IN A SENTENCE	-"Bad" is a synonym for "evil" -"Bad" and "evil" are synonyms -"Bad" and "evil" are synonymous		-"Bad" is an antonym for "good" -"Bad" and "good" are antonyms		

1. Read the diagram and then classify the following pairs of words.

	Synonyms	Antonyms	Neither
a. tall short			
b. truth lie			
c. boat house			
d. auto car			
e. gold silver			
f. small big			
g. replace return			
h. storm house			
i. cooperative uncooperative			
j. jealous envious			

CONTINUED

DO NOT REFER TO THE DIAGRAM ANY LONGER

2. Here is an example of antonyms:

   good - bad

   Make up your own example of an antonym.

   Now, in your own words, define "antonyms."

3. Here is an example of synonyms:

   sad - unhappy

   Make up your own example of a synonym.

   Now, in your own words, define "synonyms."

4. This is an incorrect definition for the word "synonyms." Change the definition.

   "Synonyms are words having opposite meanings."

5. Is this a correct definition for the word "antonyms"? If not, change it and make it correct.

   "Antonyms are words having the same meanings."

6. Write a synonym and an antonym for each of the following words:

   -happiness

   -practical

   -intelligent

   -return

   -tired

   Also write another word for each which is neither a synonym nor an antonym.

7. Define the terms "synonym" and "antonym" and give two of your own examples for each.

____

____

____

____

FINAL EXERCISE #3

FORMULATING AN INSTRUCTIONAL STRATEGY

NOT TO BE PERFORMED UNTIL ALL WORKBOOK EXERCISES ASSOCIATED WITH HANDBOOK SECTION "G" HAVE BEEN COMPLETED.

FINAL EXERCISE #3:
Formulating an Instructional Strategy

Before doing this exercise, you should have completed the following tasks:

(1) Read HANDBOOK Section "G": FORMULATE INSTRUCTIONAL STRATEGIES

and

(2) Do the WORKBOOK exercises associated with Section "G."

Your assignment in this exercise is to perform TASK G: "formulating instructional strategies." As a basis for performing this task, starting on the next page you will be given completed results for prior tasks in the materials development process.

Following your review of these results, you are to formulate an instructional strategy using the FORMS which appear in the section beginning on page 3.13.

Before doing the instructional strategy assignment, review the completed FORMS which contain the results of PRIOR DEVELOPMENT TASKS.

RESULTS OF PRIOR DEVELOPMENT TASKS WHICH ARE MADE AVAILABLE TO YOU

TASK LABEL	TASK TITLE	FORM NO.
B	Task analysis, learning analysis, competency analysis, and mode analysis	A.5(4)
D	Statement of objectives	D.2(1) and D.2(2)
E	Simulation plans	E.1(1)
F	Test development	F.2(1)

Review the results of these prior TASKS beginning on the next page.

These results reflect analyses of what is involved in teaching (secondary grade) students: (1) to identify the sign of the slope of line segments, and (2) to compute the slopes of those line segments.

NOTE: The task analysis results identifies three classes of INPUT situations which have to be discriminated:

(1a), (1b), + (1c)

--Read the note in the middle of the FORM.

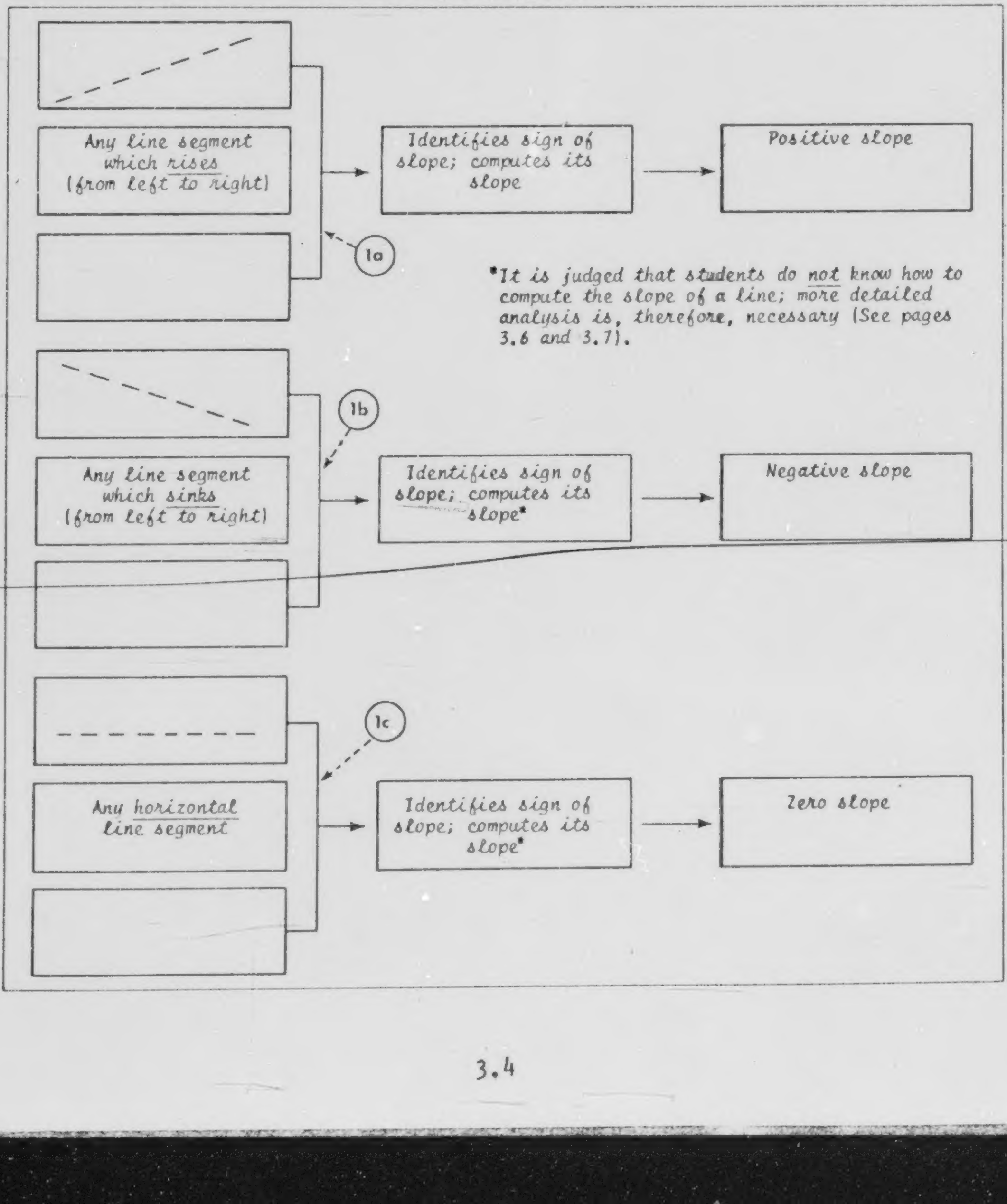
Form A-5 (4)

for TASK ☐ *STEP* ☐ *Sub-STEP* ☐

a. TASK DESCRIPTION

INPUT	ACTION	OUTPUT

b. TASK ANALYSIS


Any line segment which rises (from left to right)
Identifies sign of slope; computes its slope
Positive slope
1a
1b
Any line segment which sinks (from left to right)
Identifies sign of slope; computes its slope*
Negative slope
1c
Any horizontal line segment
Identifies sign of slope; computes its slope*
Zero slope

*It is judged that students do not know how to compute the slope of a line; more detailed analysis is, therefore, necessary (See pages 3.6 and 3.7).

NOTE: --The results of the competency analyses (the first column) reveal that in the criterion performance, TRANSFER will be a requirement; i.e., students will be given new lines whose styles must be computed.

--The results of the learning analysis that there is likely to be little difficulty learning any of the component skills (discriminations, generalizations, or associations).

COMPETENCY ANALYSIS ▽

c. LEARNING ANALYSIS

level of difficulty in acquiring

d. MODE ANALYSIS

INPUT

①

recall ☐

transfer ☒

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			X
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity			X
No. of properties			X
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic	X		
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER Kinaesthetic, smell, taste

ACTION/ CHAIN

recall ☐

transfer ☒

ASSOCIATIONS

due to ▽	hi	med	lo
No. of associations			X
associative strength of other actions			

GENERALIZATIONS

	hi	med	lo
integrative strength of action			

CHAINS

	hi	med	lo
length of chain			X
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub/vocal
recognition				
editing				
production		X		

writing

OUTPUT

recall ☐

transfer ☒

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity			
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity			
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic	X		
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

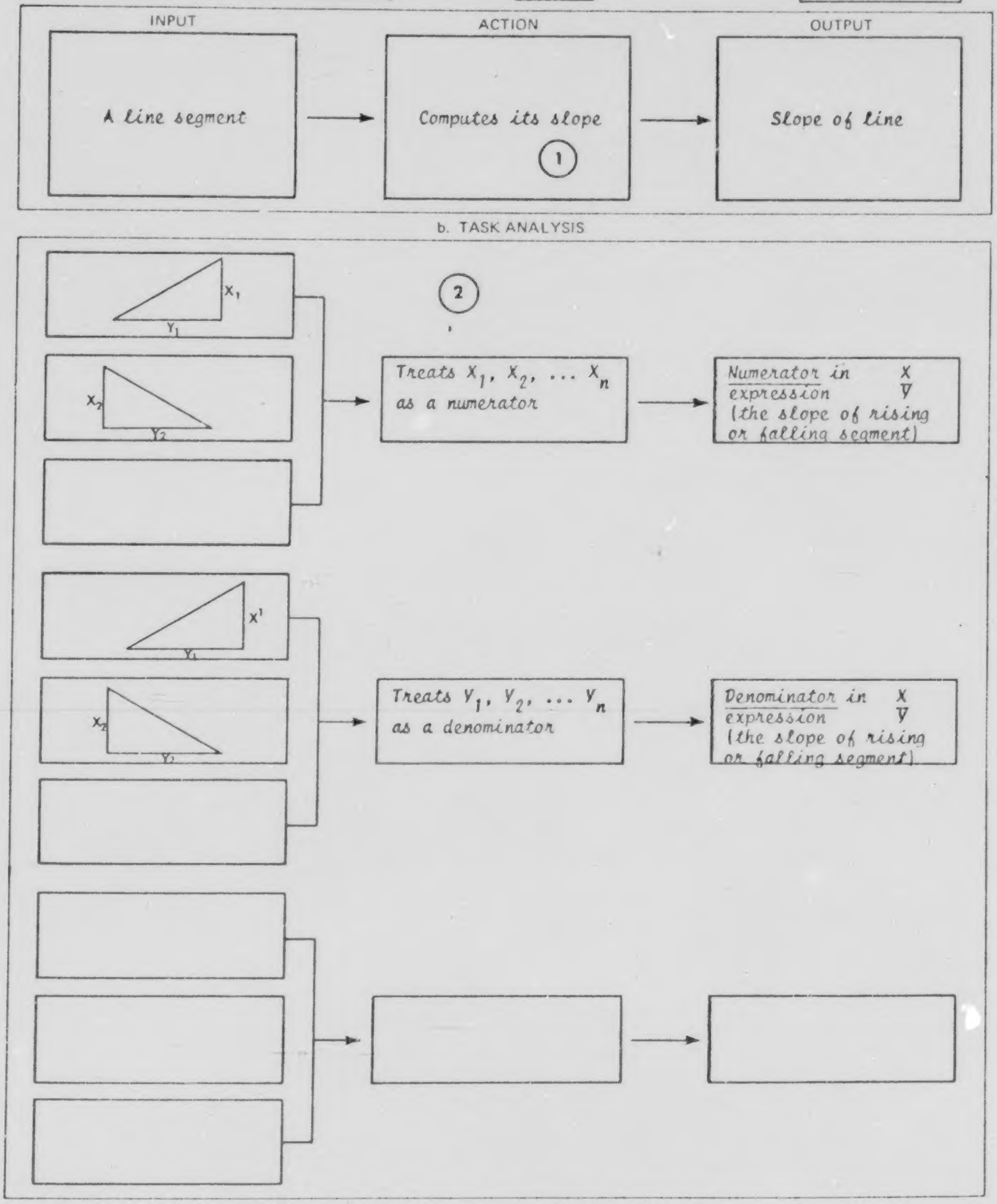
OTHER Kinaesthetic, smell, taste

NOTE: -- ① As noted by the asterisk on page 3.4, learners do not know how to compute a slope, the ACTION described in the top "task description" row.

-- ② Accordingly, a breakdown of that ACTION into its component skills is made. Part of this breakdown appears in the TASK ANALYSIS section of this diagram.

Form A-5 (4)

for TASK ☐ STEP ☐ Sub STEP ☐ a. TASK DESCRIPTION


INPUT
ACTION
OUTPUT
A line segment
Computes its slope
①
Slope of line
b. TASK ANALYSIS
②
X_1
Y_1
X_2
Y_2
Treats $X_1, X_2, \ldots X_n$ as a numerator
Numerator in expression $\frac{X}{Y}$ (the slope of rising or falling segment)
X^1
Y_1
X_2
Y_2
Treats $Y_1, Y_2, \ldots Y_n$ as a denominator
Denominator in expression $\frac{X}{Y}$ (the slope of rising or falling segment)

COMPETENCY ANALYSIS

c. LEARNING ANALYSIS

level of difficulty in acquiring

d. MODE ANALYSIS

INPUT

recall ☐

transfer ☒

DISCRIMINATIONS

due to	hi	med	lo
similarity			X
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity			X
No. of properties			X
No. of inputs			X

		symbolic	verbal	environmental
VISUAL	realistic	X		
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

ACTION/ CHAIN

recall ☐

transfer ☒

ASSOCIATIONS

due to	hi	med	lo
No. of associations			X
associative strength of other actions			

GENERALIZATIONS

	hi	med	lo
integrative strength of action			

CHAINS

	hi	med	lo
length of chain			X
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub/vocal
recognition				
editing				
production		X		

writing

OUTPUT

recall ☐

transfer ☐

DISCRIMINATIONS

due to	hi	med	lo
similarity			
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity			
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic	X		
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

Form D.1(1)

LESSON ☐

SPECIFICATION OF OBJECTIVES

	GIVEN	STUDENT WILL	RESULTING IN
	Criterion Inputs ● mode: visual/verbal/etc. ● number of examples from class ● new and/or old examples ● typical/atypical conditions ● availability of performance aids	Criterion Actions ● mode: recognition, editing, production ● alternatives: new and/or old examples ● mode: perceptual/motor/vocal/sub-vocal	Criterion Outputs ● mode: visual/verbal/etc. ● limits, standards ● quantitative: amount /degree/time limits ● qualitative
1.	CRITERION BEHAVIOR Given any horizontal, rising, or sinking line segment	Identifies the sign of the slope	Positive, negative, or zero slope correctly identified
2.	PREPARATORY BEHAVIOR (SUB-CRITERION) Given any line segment	Will compute the slope of the line	Slope of line segment
3.			

Form D.2(2)

LESSON ☐

STATEMENT OF OBJECTIVES
FOR STUDENTS

	GIVEN	YOU WILL	YOU MUST LEARN TO
	Inputs • objects, people, events, words, symbols, etc. • their properties • examples. number new or old • availability of performance aids • typical/atypical conditions • problem format e.g., single input vs. multiple choice	Actions • select, edit, or produce • type of action e.g., point to, label, write, classify, etc. **RESULTING IN** Outputs • objects, events, words, symbols, etc. • their properties (quantity/quality) • standards of acceptability	• distinguish between examples from ___ # ___ input classes • on the basis of ___ # ___ properties • see similarity among examples within each of the ___ # ___ input classes • on the basis of ___ # ___ properties • associate one of ___ # ___ actions with each one of the ___ # ___ input classes • exhibit ___ # ___ alternative actions • exhibit the series of associations in the ___ chain
1.	CRITERION BEHAVIOR Given any horizontal, rising, or sinking line segment	Identifies the sign of the slope	(1) Distinguish between three types of line segments (based on their direction) and associate a value of a "slope" for each type
2.	PREPARATORY BEHAVIOR (SUB-CRITERION) Given any line segment	Will compute the slope of the line	(2) Follow procedures for computing a slope: (a) distinguishing between types of line segments; (b) associating types of line segments with their role in computation (numerator/denominator)
3.			

Form E 1(1)

LESSON ☐ OBJECTIVE ☐

SIMULATION DECISIONS

a. assessing simulation needs due to

LOGISTICAL CONSIDERATIONS			INSTRUCTIONAL CONSIDERATIONS		
downtime	cost	danger	sampling	standardization	manipulation
N	N	N	N	N	N

b. planning simulation when needed

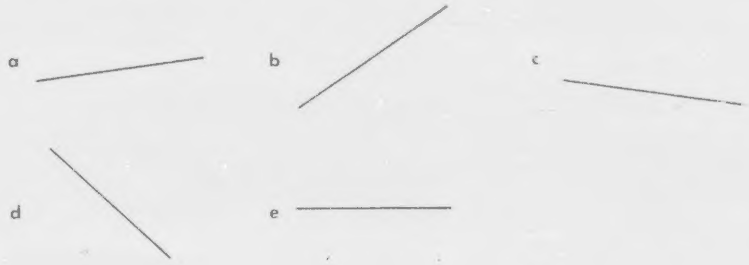
INPUT types	PROPERTIES: physical, psychological	SIMULATION PLANS: visual, audio, etc.
people man made objects natural objects events words symbols other	NO SIMULATION NEEDED	
ACTION types		
perceptual motor vocal sub-vocal		
OUTPUT types		
people man made objects natural objects events words symbols other		

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

<table>
<tr><th>"GIVEN"</th><th>INFORMATION YOU PLAN TO GIVE TO STUDENT</th></tr>
<tr><td>— Instructions
— Question or Problem
•• INPUTS (new/old)
•• AIDS (when applicable)</td><td>

What is the sign of the slope for each of these lines?



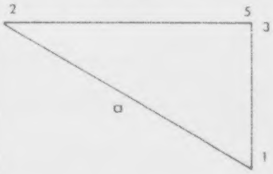
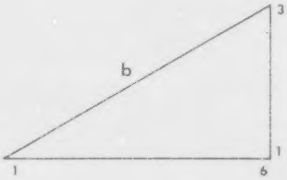
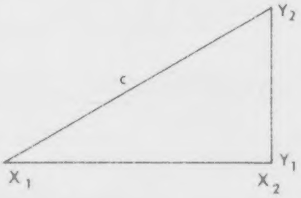
</td></tr>
<tr><td>•• ANSWER OPTIONS (when applicable)</td><td></td></tr>
</table>

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	Gives sign of the slopes

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	(a) + (b) + (c) - (d) - (e) 0

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	Compute the slopes of the following lines: (a) line a  (b) line b  (c) line c 
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	Computes the slope (a) $\frac{1 - 3}{5 - 2} =$ (b) $\frac{3 - 1}{6 - 1} =$ (c) $\frac{X_2 - X_1}{Y_2 - Y_1} = \; =$

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	(a) $-\frac{2}{3}$ (b) $\frac{2}{5}$ (c) See above

YOUR ASSIGNMENT

Based on the materials you have just reviewed, formulate your own instructional strategy:

(1) Fill in the FORM which appears on pages 3.14 and 3.15.

(2) Develop an instructional program based on the strategy you have formulated. (If necessary, consult a mathematics text.)

(3) Administer the program and the already developed tests (appearing on pages 3.11 and 3.12) to at least one student (preferably five students).

(4) Sit with the student as he goes through the program. When he makes errors, probe for their sources.

(5) Revise the program in the light of tryout results.

YOUR PRODUCTS WILL INCLUDE:

--completed FORM G.1(2): an instructional strategy

--an instructional program

--protocols of student responses to probes

--program and test data

--a revised program

CONTENTS IN THIS SECTION

FORM NO.	TITLE	PAGE
G.1(2)	Plan instructional strategies	3.14-3.15

Form G.1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE	LEARNING PROBLEMS	PROBLEM SOURCE	MODE
☐ simulation ☐ aids available ☐ two directions 1 transfer 2 delayed basis ☐ recognition mode	INPUTS 3 discriminations 4 generalizations INPUTS & ACTIONS 5 associations 6 chains ACTIONS 7 generalizations ☐ partial proficiency	INPUTS A similarity (dis-) B No. of properties C No. of classes (or, No. members/class) INPUTS & ACTIONS D existing associations E length of chain ACTIONS F integrative strength	INPUTS OUTPU *i* verbal/symbolic *i* *ii* environmental *ii* *iii* audio *iii* *iv* non-realistic *iv* *v* transient *v* ACTIONS *vi* perceptual *viii* vocal *vii* motor *ix* sub-vo

IIA. Select Preparatory Practice Progression(s)

UNIT SIZE	MODE	PROMPTING/FADING	CONTENT	FREQUENCY or VARIATION
a. shaping gradual increases in: .. quantity .. quality	b. R/E/P c. visual/verbal d. concrete/abstract e. procedures/principles	f. examples or demonstrations g. verbal cues h. visual cues i. diagramming, overviews	j. principles/procedures k. altered criterion/criterion l. errors/criterion m. editing/criterion n. backward chaining	o. repetition p. review q. varied examples

		2	A	B	C	D	E	F	*i*	*vi*	*vii*
1	q	o-p	g	g				g-j	e	h	j
3	b-q	i-o-p	g-h-k	i-g	i					h	
4	b-q	i-o-p	g-h	i-g	i-g				g	h	j
3+4	b-i-q	i-o-p	g-h	i-g	i-g				c-d-e-i		
5	b-o	i-o-p			i-g-o-p	b-g-l					
6	a-f-m-n	o-p					a-n				a-m-n
7	j	o-p						g-h-j			j

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION	PROVIDE FEEDBACK	REINFORCE PRACTICE	PROVIDE DELAYED REINFORCEMENT
Advance Organizers .. statement of objectives .. instructions *Cues* .. visual or verbal .. formats, diagrams .. checklists	*Correctness of Answers (Solutions)* .. standard available for comparison .. discrimination practice re: correct outputs	*Intrinsic Reinforcers* .. interesting materials *Extrinsic Reinforcers* .. social .. monetary .. activities .. grades	*Extrinsic Reinforcers* .. social .. monetary .. activities

IB. Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
EXAMPLE(S) properties of additional examples			

IIB. Design Preparatory Practice Progression

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT
1st			
2nd			
3rd			

IIC. Characterize

MODE		
INPUTS		OUTPUTS
☐ i	verbal/symbolic	☐ i
☐ ii	environmental	☐ ii
☐ iii	audio	☐ iii
☐ iv	non-realistic	☐ iv
☐ v	transient	☐ v
	ACTIONS	
☐ vi	perceptual	
☐ vii	motor	
☐ viii	vocal	
☐ ix	subvocal	

IV. Select Media

INPUT/OUTPUT DISPLAY

r	print	s.	environmental	t.	devices
r 1	verbal	s 1	people (behavior)	t 1	film, TV
r 2	pictorial	s.2	objects	t 2	slides, projectors
		s.3	events	t 3	simulator
				t 4	audio-tape

	i verbal/symbolic		ii environmental		
INPUTS ➤ ▼	iii audio	visual	iii audio	visual v transient	non-v
realistic	s 1		s 2 s 3	s 3	s 1 s 2
iv non-realistic	t 4	r 1 r 2 t 1 t 2 t 3	t 4	t 1 t 3	t 2 t 3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS ➤	i verbal/symbolic		ii environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non-v.
vi & ix	t 4	u		u		
vii		u	t 4	u	t 1	s 2 t 3
viii	t 4					

DO NOT TURN PAGE
UNTIL AFTER YOU HAVE COMPLETED
YOUR OWN FORM G.1(2)

Form G 1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE	LEARNING PROBLEMS	PROBLEM SOURCE	MODE
☐ simulation ☐ aids available ☐ two directions [✓ 1] transfer 2 delayed basis ☐ recognition mode	INPUTS [✓ 3] discriminations [✓ 4] generalizations INPUTS & ACTIONS 5 associations [✓ 6] chains ACTIONS 7 generalizations ☐ partial proficiency	INPUTS A similarity (dis-) B No. of properties C No. of classes (or, No. members/class) INPUTS & ACTIONS D existing associations E length of chain ACTIONS F integrative strength	INPUTS / OUTPUTS [✓ i] verbal/symbolic [✓ i] ii environmental ii iii audio iii iv non-realistic iv v transient v ACTIONS vi perceptual viii vocal [✓ vii] motor ix sub-vocal

writing

IIA. Select Preparatory Practice Progression(s)

UNIT SIZE	MODE	PROMPTING/FADING	CONTENT	FREQUENCY or VARIATION
a shaping gradual increases in quantity quality	b R/E/P c visual/verbal d concrete/abstract e procedures/principles	f examples or demonstrations g verbal cues h visual cues i diagramming, overviews	j principles/procedures k altered criterion/criterion l errors/criterion m editing/criterion n backward chaining	o repetition p review q varied examples

		2	A	B	C	D	E	F	i	vi	vii
1	[✓ q]	o-p	g	g				g-j	[✓ e]	h	j
3	b-q	i-o-p	g-h-k	i-g	i					h	
4	b-q	i-o-p	g-h	i-g	i-g				g	h	j
3+4	[✓ b-i-q]	i-o-p	g-h	i-g	i-g				c-d-e-i		
5	i-c	i-o-p			i-g-o-p	b-g-l					
6	[✓ a-f-m-n]	o-p					a-n				a-m-n
7	j	o-p						g-h-j			j

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION	PROVIDE FEEDBACK	REINFORCE PRACTICE	PROVIDE DELAYED REINFORCEMENT
Advance Organizers statement of objectives instructions *Cues* visual or verbal formats, diagrams checklists	*Correctness of Answers (Solutions)* standard available for comparison discrimination practice re: correct outputs	*Intrinsic Reinforcers* interesting materials *Extrinsic Reinforcers* social monetary activities grades	*Extrinsic Reinforcers* social monetary activities

. Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
EXAMPLE(S) properties of additional examples	(a) Line segment with positive, negative, or zero slopes (b) One line segment with X and Y values provided	Identify sign of slope Compute the slope of the lines	Correct identification Correct slope

B. Design Preparatory Practice Progression

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT
Diagrams + 1st Recognition items	(a) Elements in "slope" computation (plus answer options) (d) Conditions for +, -, or zero slopes)	(b) Select numerator and denominator in ratio that defines slope (e) Select correct signs for examples used	(c) Correct values for computing slope (f) Correct identification
Without diagrams 2nd	Repeat of above, i.e., recognition practice but without diagrams		
Editing 3rd	(a) Lines correctly or incorrectly identified for sign of slope (b) Problem model + new problems	(b) Edits (e) Computes slopes	(c) Change in sign identification (f) Correct slopes

IIC. Characterize

MODE

INPUTS		OUTPUTS
☐ i	verbal/symbolic	☐ i
☐ ii	environmental	☐ ii
☐ iii	audio	☐ iii
☐ iv	non-realistic	☐ iv
☐ v	transient	☐ v

ACTIONS

☐ vi perceptual
☐ vii motor
☐ viii vocal
☐ ix subvocal

. Select Media

NPUT/OUTPUT DISPLAY

r.	print	s	environmental	t	devices
.1	verbal	s.1	people (behavior)	t.1	film, TV
.2	pictorial	s.2	objects	t.2	slides, projectors
		s.3	events	t.3	simulator
				t.4	audio-tape

	i verbal/symbolic		ii environmental		
NPUTS	iii audio	visual	iii audio	visual v transient	non-v.
realistic	s.1		s.2 s.3	s.3	s.1 s.2
iv non-realistic	t.4	r.1 [✓ r.2] t.1 t.2 t.3	t.4	t.1 t.3	t.2 t.3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u.	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS	i verbal/symbolic		ii environmental			
ACTIONS	iii	iv	iii	iv	v	non-v.
vi & ix	t.4	u		u		
vii		[✓ u]	t.4	u	t.1	s.2 t.3
viii	t.4					

No suggested program is provided. The empirical tryout of your own program provides you with the valuable type of feedback you need.

FINAL EXERCISE #4

DEVELOPING TESTS

NOT TO BE PERFORMED UNTIL ALL WORKBOOK EXERCISES ASSOCIATED WITH HANDBOOK SECTION "F" HAVE BEEN COMPLETED.

FINAL EXERCISE #4:
Developing Tests

Before doing this exercise, you should have completed the following tasks:

(1) Read HANDBOOK Section "F": DEVELOP DIAGNOSTIC AND EVALUATIVE TESTS

and

(2) Do the WORKBOOK exercises associated with Section "F."

Your assignment in this exercise is to perform TASK F: "developing criterion tests." As a basis for performing this task, starting on the next page you will be given completed results for prior tasks in the materials development process.

Following your review of these results, you are to develop your own tests using the FORMS which appear in the section which begins on page 4.9.

Before doing the "test development" assignment, review the completed FORMS which contain the results of PRIOR DEVELOPMENT TASKS.

RESULTS OF PRIOR DEVELOPMENT TASKS
WHICH ARE MADE AVAILABLE TO YOU

TASK LABEL	TASK TITLE	FORM NO.
B	Task analysis, learning analysis, competency analysis, and mode analysis	A.5(4)
D	Statement of objectives	D.2(1) and D.2(2)
E	Simulation plans	E.1(1)

Form A-5 (4)

for TASK ☐ STEP ☐ Sub-STEP ☐

a. TASK DESCRIPTION

INPUT	ACTION	OUTPUT
Desirable and undesirable student behavior in classroom →	(Teacher) uses appropriate "reinforcement" technique →	Increase of desirable student behavior and decrease of undesirable behavior

b. TASK ANALYSIS

Short durations of attention or work ⋮ Range of approximations to desirable behavior →	Provides reinforcement only for improvements (verbal, physical, use of tokens, etc.) →	Shaping of increasingly longer/better behavior
Participating in group activities ⋮ Any full-fledged desirable behavior - which occurs too infrequently →	Provides reinforcement for each occasion (verbal, physical, use of tokens, etc.) →	Strengthening existing behavior
Hyperactivity Fighting ⋮ Any undesirable behavior maintained by attention →	Ignores →	Extinction of undesirable behavior

COMPETENCY ANALYSIS ▽	c. LEARNING ANALYSIS	d. MODE ANALYSIS

level of difficulty in acquiring

INPUT

recall ☐

transfer ☒

DISCRIMINATIONS

between full-fledged desirable and approximations

due to ▽	hi	med	lo
similarity		X	
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity	X		
No. of properties			X
No. of inputs	X		

		symbolic	verbal	environmental
VISUAL	realistic			X
	reproduced/ fabricated			
AUDIO	realistic		X	
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

ACTION/ CHAIN

recall ☐

transfer ☒

ASSOCIATIONS

due to ▽	hi	med	lo
No. of associations			
associative strength of other actions	X		

tendency to punish for undesirable behaviors and to ignore desirable behavior

GENERALIZATIONS

	hi	med	lo
integrative strength of action			X

CHAINS

	hi	med	lo
length of chain			X
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub-vocal
recognition				
editing				
production		X	X	

OUTPUT

recall ☐

transfer ☒

DISCRIMINATIONS

due to ▽	hi	med	lo
similarity		X	
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity		X	
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic			X
	reproduced/ fabricated			
AUDIO	realistic		X	
	reproduced/ fabricated			

OTHER: Kinaesthetic, smell, taste

Form D 1(1)

LESSON ☐

SPECIFICATION OF OBJECTIVES

	GIVEN	STUDENT WILL	RESULTING IN
	Criterion Inputs ● mode: visual/verbal/etc. ● number of examples from class ● new and/or old examples ● typical/atypical conditions ● availability of performance aids	Criterion Actions ● mode: recognition, editing, production ● alternatives: new and/or old examples ● mode: perceptual/motor/vocal/sub-vocal	Criterion Outputs ● mode: visual/verbal/etc. ● limits, standards ● quantitative: amount /degree/time limits ● qualitative
1.	CRITERION Any example of student behavior (desirable or undesirable) occurring in an actual classroom; behavior can be verbal or physical	Teacher will apply the appropriate technique (shaping, reinforcing, or ignoring): -In a correct way -For correct durations (over time)	Changes in student behavior: -Increased strength or frequency of desirable behavior -Decreased frequency of undesirable behavior
2.	PREPARATORY (SUB-CRITERION) A verbal description of problem behaviors	Teacher will verbally identify properties or attributes that call for a particular management strategy; will describe the details of carrying out the strategy (conditions)	Correct verbal discussion of problem and ways of dealing with it
3.			

Form D 2(2)

LESSON ☐

STATEMENT OF OBJECTIVES
FOR STUDENTS

	GIVEN	**YOU WILL**	**YOU MUST LEARN TO**
	Inputs ● objects, people, events, words, symbols, etc. ● their properties ● examples number new or old ● availability of performance aids ● typical/atypical conditions ● problem format e.g., single input vs. multiple choice	Actions ● select, edit, or produce ● type of action e.g., point to, label, write, classify, etc. **RESULTING IN** Outputs ● objects, events, words, symbols, etc. ● their properties (quantity/quality) ● standards of acceptability	● distinguish between examples from ___ # ___ input classes ● on the basis of ___ # ___ properties ● see similarity among examples within each of the ___ # ___ input classes ● on the basis of ___ # ___ properties ● associate one of ___ # ___ actions with each one of the ___ # ___ input classes ● exhibit ___ # ___ alternative actions ● exhibit the series of associations in the ___ chain
1.	CRITERION Any example of student behavior (desirable or undesirable) occurring in an actual classroom; behavior can be verbal or physical	Teacher will apply the appropriate technique (shaping, reinforcing, or ignoring): -In a correct way -For correct durations (over time)	To distinguish between three types of problem behavior; the distinction is based first of all on: (a) whether it is desirable behavior or undesirable behavior; (b) how frequently it occurs; (c) if desirable, whether it is at full strength or an approximation
2.	PREPARATORY (SUB-CRITERION) A verbal description of problem behaviors	Teacher will verbally identify properties or attributes that call for a particular management strategy; will describe the details of carrying out the strategy (conditions)	Then you will have to learn to apply a different technique for each of the three types of problems
3.			

Form E-1(1)

LESSON ☐ OBJECTIVE ☐ SIMULATION DECISIONS

a. assessing simulation needs due to

LOGISTICAL CONSIDERATIONS			INSTRUCTIONAL CONSIDERATIONS		
down time	cost	danger	sampling	standardization	manipulation
N	N	A	A	A	A

b. planning simulation when needed

INPUT types	PROPERTIES: physical, psychological	SIMULATION PLANS: visual, audio, etc.
people man made objects natural objects events words symbols other	Desirable student behavior: ••Only an approximation ••Frequency of occurrence Undesirable student behavior	-Verbal descriptions ✓ -Filmed examples -Role-playing (actual students, or fellow teacher trainees) -Actual classroom ✓

ACTION types		
perceptual motor vocal sub-vocal	Verbally or physically delivers reinforcement	-Paper and pencil ✓ -Oral responses ✓ -Acting out (in role-play situation)

OUTPUT types		
people man made objects natural objects events words symbols other	Changes in student behavior: ••Frequency ••Approximation to ideal	-Verbal feedback ✓ -Role-play feedback -Actual feedback (student behavior) ✓

YOUR ASSIGNMENT

Based on the materials you have just reviewed, develop your own tests:

(1) Fill in the test development FORMS which appear on the next several pages (using as many of them as you feel you need);

(2) Formulate an instructional strategy (basing it on all completed results). Fill in the instructional strategy FORM.

(3) (OPTIONAL) As time permits, carry out the remaining TASKS in the instructional materials development process (i.e., develop a program, administer it and the tests you have developed, and revise the program in the light of tryout results).

YOUR PRODUCTS WILL INCLUDE:*

--completed FORMS F.2(1): Tests

--completed FORM G.1(2): Instructional Strategy

**the minimum requirement*

CONTENTS IN THIS SECTION

FORM NO.	TITLE	PAGE
F.2(1)	Test development	4.10-4.13
G.1(2)	Plan instructional strategies	4.14-4.15

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
– Instructions – Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
– ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
– OUTPUT •• answers •• product – Type of Scoring – Standards for Scoring	

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
– Instructions – Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
– ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
– OUTPUT •• answers •• product – Type of Scoring – Standards for Scoring	

Form G.1(2)

LESSON ☐ CRITERION BEHAVIOR ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE	LEARNING PROBLEMS	PROBLEM SOURCE	MODE
☐ simulation ☐ aids available ☐ two directions 1 transfer 2 delayed basis ☐ recognition mode	INPUTS 3 discriminations 4 generalizations INPUTS & ACTIONS 5 associations 6 chains ACTIONS 7 generalizations ☐ partial proficiency	INPUTS A similarity (dis-) B No. of properties C No. of classes (or, No. members/class) INPUTS & ACTIONS D existing associations E length of chain ACTIONS F integrative strength	INPUTS — OUTPUT i verbal/symbolic i ii environmental ii iii audio iii iv non realistic iv v transient v ACTIONS vi perceptual viii vocal vii motor ix sub-voca

IIA. Select Preparatory Practice Progression(s)

UNIT SIZE	MODE	PROMPTING/FADING	CONTENT	FREQUENCY or VARIATION
a. shaping gradual increases in ______ . . quantity . . quality	b. R/E/P c. visual/verbal d. concrete/abstract e. procedures/principles	f. examples or demonstrations g. verbal cues h. visual cues i. diagramming, overviews	j. principles/procedures k. altered criterion/criterion l. errors/criterion m. editing/criterion n. backward chaining	o. repetition p. review q. varied examples

		2	A	B	C	D	E	F	*i*	*vi*	*vii*
1	q	o-p	g	g				g-j	e	h	j
3	b-q	i-o-p	g-h-k	i-g	i					h	
4	b-q	i-o-p	g-h	i-g	i-g				g	h	j
3+4	b-i-q	i-o-p	g-h	i-g	i-g				c-d-e-i		
5	b-o	i-o-p			i-g-o-p	b-g-l					
6	a-f-m-n	o-p					a-n				a-m-n
7	l	o-p						g-h-j			j

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION	PROVIDE FEEDBACK	REINFORCE PRACTICE	PROVIDE DELAYED REINFORCEMENT
Advance Organizers . . statement of objectives . . instructions *Cues* . . visual or verbal . . formats, diagrams . . checklists	*Correctness of Answers (Solutions)* . . standard available for comparison . . discrimination practice re: correct outputs	*Intrinsic Reinforcers* . . interesting materials *Extrinsic Reinforcers* . . social . . monetary . . activities . . grades	*Extrinsic Reinforcers* . . social . . monetary . . activities

B. Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
EXAMPLE(S) properties of additional examples			

IB. Design Preparatory Practice Progression

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT
1st			
2nd			
3rd			

IIC. Characterize

MODE		
INPUTS		OUTPUTS
i	verbal/symbolic	*i*
ii	environmental	*ii*
iii	audio	*iii*
iv	non-realistic	*iv*
v	transient	*v*
	ACTIONS	
vi	perceptual	
vii	motor	
viii	vocal	
ix	subvocal	

V. Select Media

INPUT/OUTPUT DISPLAY

r.	print	s.	environmental	t.	devices
r.1	verbal	s.1	people (behavior)	t.1	film, TV
r.2	pictorial	s.2	objects	t.2	slides, projectors
		s.3	events	t.3	simulator
				t.4	audio tape

	i verbal/symbolic		*ii* environmental		
INPUTS ➤ ▼	*iii* audio	visual	*iii* audio	visual	
				v transient	non-v
realistic	s.1		s.2 s.3	s.3	s.1 s.2
iv non-realistic	t.4	r.1 r.2 t.1 t.2 t.3	t.4	t.1 t.3	t.2 t.3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u.	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS➤	*i* verbal/symbolic		*ii* environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non-v.
vi & ix	t.4	u		u		
vii		u	t.4	u	t.1	s.2 t.3
viii	t.4					

4.15 /4 16

DO NOT TURN PAGE
UNTIL YOU HAVE COMPLETED THE
FORMS ON PAGES 4.10-4.15

AFTER you have developed your own tests and have formulated an instructional strategy, refer to the suggested solutions which appear on the next several pages.

Form F.2(1)

LESSON ☐ OBJECTIVE ☐ FORM FOR TEST DEVELOPMENT

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	Case Study: "Never waiting to be called on, Johnny always blurts out answers questions. Mrs. Jones then usually asks others if Johnny's answers are right or wrong. Or, she may herself tell Johnny whether he is right or wrong." What should Mrs. Jones do to get Johnny to stop blurting out answers and to raise his hand to be called on?
•• ANSWER OPTIONS (when applicable)	

(Other comparable items - four in number)

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	Write a comparable answer: "Mrs. Jones should ignore Johnny when he blurts out answers and call on someone else. When he does raise his hand, she should call on him sometimes."

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	See above for answer

Form F 2(1)

LESSON ☐ OBJECTIVE ☐ FORM FOR TEST DEVELOPMENT

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	Case Study: "Only on occasion does Sally volunteer to participate in group activities. Her teacher would like her to do this more often." What should her teacher do to bring this about?
•• ANSWER OPTIONS (when applicable)	

(Other comparable items - four in number)

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	Written answer: "The teacher should reinforce (a reinforcer appropriate to Sally) each instance in which Sally does volunteer."

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	See above for answer.

Form F 2(1)

LESSON ☐ OBJECTIVE ☐ FORM FOR TEST DEVELOPMENT

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
– Instructions – Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	Case Study: "Clara will concentrate on an assignment for no more than a minute or two at a time. Her teacher would like to get her to work for a whole class period." What should her teacher do?
•• ANSWER OPTIONS (when applicable)	

(Other comparable items - four in number)

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
– ACTIONS (new/old) •• mode	Written answer: "Make a contract with Clara for gradually longer and longer durations. Come to agreement with her about a reinforcement and deliver the reinforcement only if contract terms are met."

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
– OUTPUT •• answers •• product – Type of Scoring – Standards for Scoring	See above for answer.

Form G-1(2)

LESSON ☐ *CRITERION BEHAVIOR* ☐

IA. Characterize Criterion Practice Requirements

PERFORMANCE	LEARNING PROBLEMS	PROBLEM SOURCE	MODE
[✓ ☐] simulation ☐ aids available ☐ two directions [✓ 1] transfer 2 delayed basis ☐ recognition mode	INPUTS [✓ 3] discriminations [✓ 4] generalizations INPUTS & ACTIONS [✓ 5] associations 6 chains ACTIONS 7 generalizations ☐ partial proficiency	INPUTS [✓ A] similarity (dis.) B No. of properties [✓ C] No. of classes (or, No. members/class) INPUTS & ACTIONS [✓ D] existing associations E length of chain ACTIONS F integrative strength	INPUTS — OUTPUTS *i* verbal/symbolic *i* [✓ *ii*] environmental [✓ *ii*] *iii* audio *iii* *iv* non-realistic *iv* [✓ *v*] transient *v* ACTIONS *vi* perceptual [✓ *viii*] vocal *vii* motor *ix* sub-vocal

IIA. Select Preparatory Practice Progression(s)

UNIT SIZE	MODE	PROMPTING/FADING	CONTENT	FREQUENCY or VARIATION
a shaping gradual increases in: quantity, quality	b R/E/P c visual/verbal d concrete/abstract e procedures/principles	f examples or demonstrations g verbal cues h visual cues i diagramming overviews	j principles/procedures k altered criterion/criterion l errors/criterion m editing/criterion n backward chaining	o repetition p review q varied examples

		2	A	B	C	D	E	F	*i*	*vi*	*vii*
1	q	o-p	g	g				g-j	e	h	l
3	b-q	i-o-p	g-h-k	i-g	i					h	
4	b-q	i-o-p	g-h	i-g	i-g				g	h	l
3+4	[✓ b-i-q]	i-o-p	[✓ g-h]	i-g	i-g				c-d-e-i		
5	[✓ b-o]	i-o-p			i-g-o-p	[✓ b-g-l]					
6	a-f-m-n	o-p					a-n				a-m-n
7	j	o-p						g-h-j			j

III. Plan Behavior Control

PROMPT • OBSERVATION • ATTENTION	PROVIDE FEEDBACK	REINFORCE PRACTICE	PROVIDE DELAYED REINFORCEMENT
Advance Organizers statement of objectives instructions *Cues* visual or verbal formats, diagrams checklists	*Correctness of Answers (Solutions)* standard available for comparison discrimination practice for correct outputs	*Intrinsic Reinforcers* interesting materials *Extrinsic Reinforcers* social monetary activities grades	*Extrinsic Reinforcers* ✓ social monetary activities Reinforcements for teachers to get them to use "reinforcement" with their students

IB. Design Criterion Practice

	GIVEN as INPUT	STUDENT WILL take ACTION	RESULTING IN OUTPUT
EXAMPLE(S) properties of additional examples	Problem behavior occurring in an actual classroom which requires: shaping, reinforcement, or ignoring; e.g., inattentiveness, talking to peers (infrequently), or hyperactivity	Teachers will take appropriate steps	Changes in the behavior of their students

IIB. Design Preparatory Practice Progression

PROGRESSION	given as INPUT	student will take ACTION	resulting in OUTPUT
1st	Paper-and-pencil case studies; recognition level; discriminating between types of problems	Select from options an identification of problem types	Correct identification
2nd	Case studies: problems of each of the three types	Select and edit the right techniques for problem types	Description of appropriate implementation technique
3rd	Instructions to guided classroom exercise - example of problem type to be selected	Manage selected problem for period of week	Record of results of changes in student's behavior and record of what teacher did

IIC. Characterize

MODE

INPUTS		OUTPUTS
[✓ i]	verbal/symbolic	[✓ i]
ii	environmental	ii
iii	audio	iii
iv	non realistic	iv
v	transient	v
	ACTIONS	
vi	perceptual	
[✓ vii]	motor	
viii	vocal	
ix	subvocal	

IV. Select Media

INPUT/OUTPUT DISPLAY

r	print	s	environmental	t	devices
r.1	verbal	s.1	people (behavior)	t.1	film, TV
r.2	pictorial	s.2	objects	t.2	slides, projectors
		s.3	events	t.3	simulator
				t.4	audio tape

	i verbal/symbolic		ii environmental		
INPUTS ► ▼	iii audio	visual	iii audio	visual	
				v transient	non-v
realistic	s.1		s.2 s.3	s.3	s.1 s.2
iv non realistic	t.4	[✓ r.1] r.2 t.1 t.2 t.3	t.4	t.1 t.3	t.2 t.3

ACTION CAPABILITY / RECORD CAPABILITY

performance accommodation		record capabilities	
t.3	simulator	u.	paper and pencil
s.2	objects, equipment (manipulanda)	t.1	film, TV
		t.4	audio tape

OUTPUTS►	i verbal/symbolic		ii environmental			
ACTIONS ▼	iii	iv	iii	iv	v	non-v
vi & ix	t.4	u		u		
vii		[✓ u]	t.4	u	t.1	s.2 t.3
viii	t.4					

FINAL EXERCISE #5

PLANNING SIMULATION

NOT TO BE PERFORMED UNTIL ALL WORKBOOK EXERCISES ASSOCIATED WITH HANDBOOK SECTION "E" HAVE BEEN COMPLETED.

FINAL EXERCISE #5:
Planning Simulation

Before doing this exercise, you should have completed the following tasks:

(1) Read HANDBOOK Section "E": PLAN SIMULATION

and

(2) Do the WORKBOOK exercises associated with Section "E."

Your assignment in this exercise is to perform TASK E: "assessing simulation needs and planning simulation". As a basis for performing this task, starting on the next page you will be given completed results for prior tasks in the materials development process:

Following your review of these results, you are to develop your simulation plans using the FORM which appears in the section beginning on page 5.9.

Before doing the "simulation" assignment, review the completed FORMS which contain the results of PRIOR DEVELOPMENT TASKS.

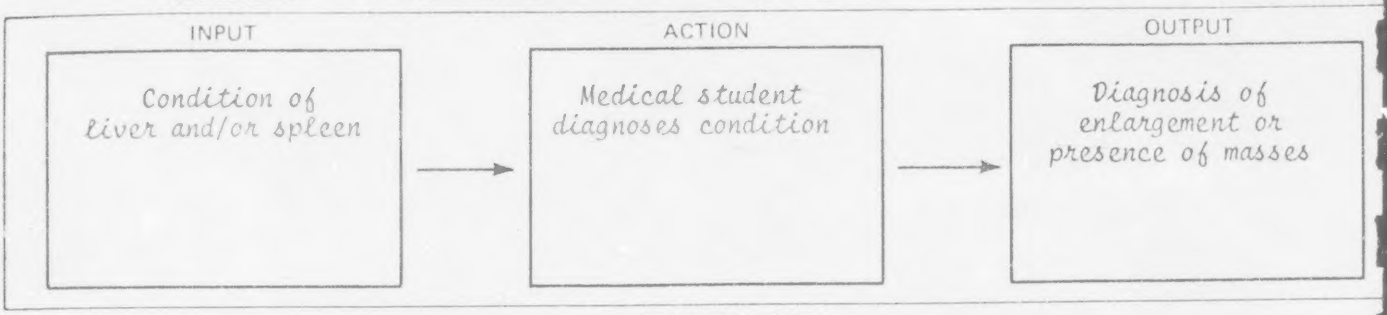
RESULTS OF PRIOR DEVELOPMENT TASKS WHICH ARE MADE AVAILABLE TO YOU

TASK LABEL	TASK TITLE	FORM NO.
B	Task analysis, learning analysis; competency analysis, and mode analysis	A.5(4)
D	Statement of objectives	D.2(1) and D.2(2)

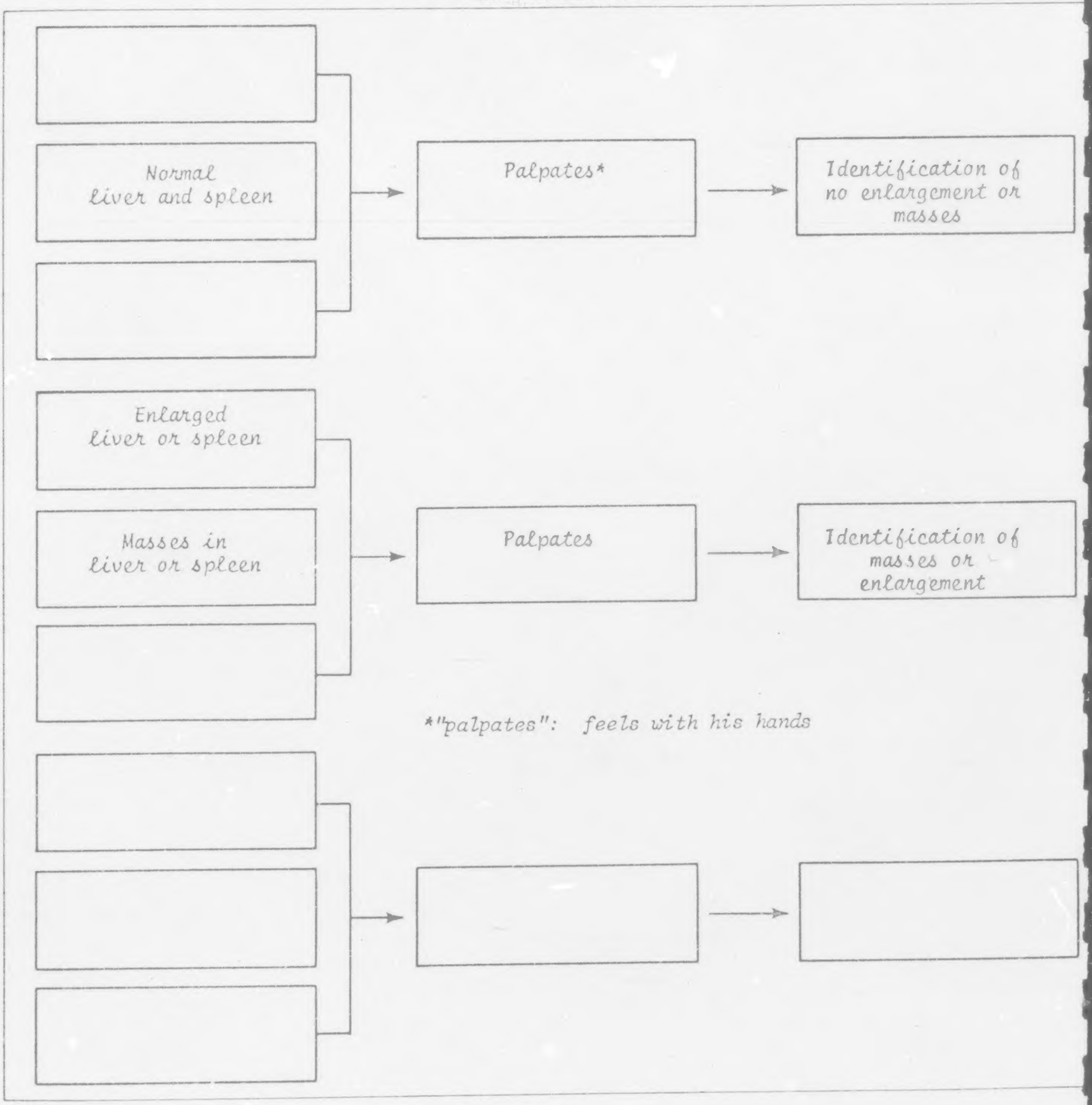
Form A-5 (4)

for TASK ☐ STEP ☐ Sub-STEP ☐

a. TASK DESCRIPTION


INPUT
ACTION
OUTPUT
Condition of liver and/or spleen
Medical student diagnoses condition
Diagnosis of enlargement or presence of masses

b. TASK ANALYSIS


Normal liver and spleen
Palpates*
Identification of no enlargement or masses
Enlarged liver or spleen
Masses in liver or spleen
Palpates
Identification of masses or enlargement

*"palpates": feels with his hands

COMPETENCY ANALYSIS

c. LEARNING ANALYSIS

level of difficulty in acquiring

d. MODE ANALYSIS

INPUT

recall ☐

transfer ☐

DISCRIMINATIONS

due to	hi	med	lo
similarity		X	
No. of properties			X
No. of inputs			X

GENERALIZATIONS

	hi	med	lo
dissimilarity		X	
No. of properties			X
No. of inputs		X	

		symbolic	verbal	environmental
VISUAL	realistic			X
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: [✓ Kinaesthetic], smell, taste

ACTION/ CHAIN

recall ☐

transfer ☐

ASSOCIATIONS

due to	hi	med	lo
No. of associations			X
associative strength of other actions			

GENERALIZATIONS

	hi	med	lo
integrative strength of action			

CHAINS

	hi	med	lo
length of chain			X
output discrimination problems			
associative strength of other actions			

	perceptual	motor	vocal	sub-vocal
initiation				
editing				
production	X	X		

touch

OUTPUT

recall ☐

transfer ☐

DISCRIMINATIONS

due to	hi	med	lo
similarity			
No. of properties			
No. of inputs			

GENERALIZATIONS

	hi	med	lo
dissimilarity			
No. of properties			
No. of inputs			

		symbolic	verbal	environmental
VISUAL	realistic			
	reproduced/ fabricated			
AUDIO	realistic			
	reproduced/ fabricated			

OTHER: [✓ Kinaesthetic], smell, taste

Form D2(1)

LESSON ☐

SPECIFICATION OF OBJECTIVES

	GIVEN	STUDENT WILL	RESULTING IN
	Criterion Inputs ● mode: visual/verbal/etc. ● number of examples from class ● new and/or old examples ● typical/atypical conditions ● availability of performance aids	Criterion Actions ● mode: recognition, editing, production ● alternatives: new and/or old examples ● mode: perceptual/motor/vocal/sub-vocal	Criterion Outputs ● mode: visual/verbal/etc. ● limits, standards ● quantitative: amount /degree/time limits ● qualitative
1.	CRITERION BEHAVIOR Given an enlarged or normal liver or spleen - or liver or spleen with masses in it	Will palpate and identify condition	Identification of presence or absence of enlargement or masses
2.			
3.			

Form D 2(2)

LESSON ☐

STATEMENT OF OBJECTIVES
FOR STUDENTS

GIVEN	YOU WILL	YOU MUST LEARN TO
Inputs • objects, people, events, words, symbols, etc. • their properties • examples number new or old • availability of performance aids • typical/atypical conditions • problem format e.g., single input vs. multiple choice	Actions • select, edit, or produce • type of action e.g., point to, label, write, classify, etc. **RESULTING IN** Outputs • objects, events, words, symbols, etc. • their properties (quantity/quality) • standards of acceptability	• distinguish between examples from ___ # ___ input classes • on the basis of ___ # ___ properties • see similarity among examples within each of the ___ # ___ input classes • on the basis of ___ # ___ properties • associate one of ___ # ___ actions with each one of the ___ # ___ input classes • exhibit ___ # ___ alternative actions • exhibit the series of associations in the ___ chain

	CRITERION BEHAVIOR Given an enlarged or normal liver or spleen - or liver or spleen with masses in it	Will palpate and identify condition	Identification of presence or absence of enlargement or masses
1.			
2.			
3.			

YOUR ASSIGNMENT

Based on the materials you have just reviewed, assess simulation needs and plan it (if necessary).

(1) Fill in the simulation FORM which appears on the next page.

(2) Develop criterion tests (using the test development FORM which also appears in this section).

(3) (OPTIONAL) As time permits carry out the remaining TASKS in the development process (all the way through to the tryout and review of an instructional program).

YOUR PRODUCTS WILL INCLUDE:*

--completed FORM E.1(1): Simulation plans
--completed FORM F.2(1): Tests

* *as a minimum requirement.*

CONTENTS IN THIS SECTION

FORM NO.	TITLE	PAGE
E.1(1)	Simulation decisions	5.10
F.2(1)	Test development	5.11-5.12

Form E.1(1)

SIMULATION DECISIONS

LESSON ☐ OBJECTIVE ☐

a. assessing simulation needs due to →

LOGISTICAL CONSIDERATIONS			INSTRUCTIONAL CONSIDERATIONS		
downtime	cost	danger	sampling	standardization	manipulation
☐	☐	☐	☐	☐	☐

b. planning simulation when needed

INPUT types	PROPERTIES. physical, psychological	SIMULATION PLANS: visual, audio, etc.
people man made objects natural objects events words symbols other		
ACTION types		
perceptual motor vocal sub-vocal		
OUTPUT types		
people man made objects natural objects events words symbols other		

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	

Form F.2(1)

LESSON ☐ *OBJECTIVE* ☐ *FORM FOR TEST DEVELOPMENT*

"GIVEN"	INFORMATION YOU PLAN TO GIVE TO STUDENT
— Instructions — Question or Problem •• INPUTS (new/old) •• AIDS (when applicable)	
•• ANSWER OPTIONS (when applicable)	

"STUDENT WILL"	WHAT THE STUDENT IS EXPECTED TO DO
— ACTIONS (new/old) •• mode	

"RESULTING IN"	WHAT THE STUDENT IS EXPECTED TO TURN OUT
— OUTPUT •• answers •• product — Type of Scoring — Standards for Scoring	

DO NOT TURN PAGE UNTIL
YOU HAVE COMPLETED
FILLING OUT THE FORMS
ON THE PRECEDING PAGES.